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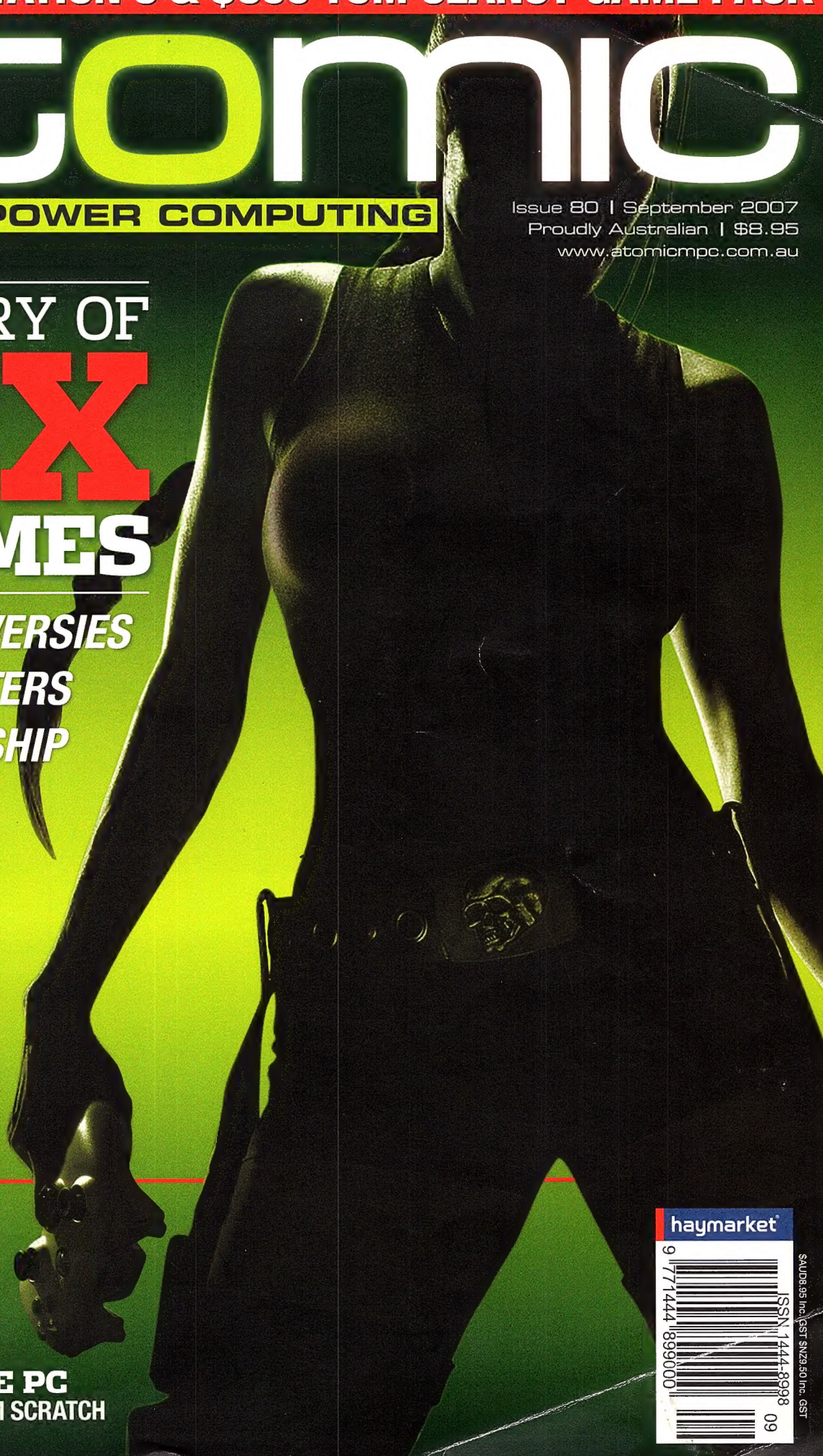
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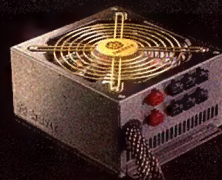
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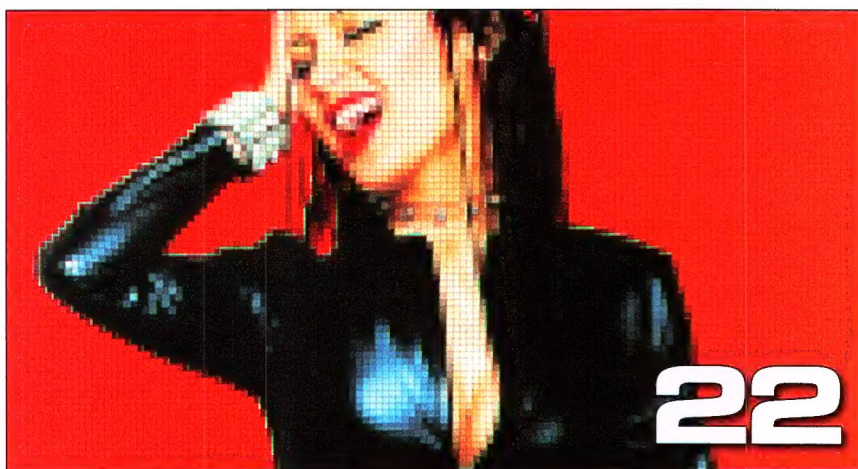
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CONTENTS



FEATURES

Sex in games 22

James Matson takes a serious look at the role sex has played in the development of games.

HTPC tutorial part one 31

It's your home and you want a theatre – Adam Turner to the rescue!

Head to head: Game-to-movie 42

Chris Taylor does the impossible – sit through an Uwe Boll film! Read his obituary here.

Engine Room: World in Conflict 66

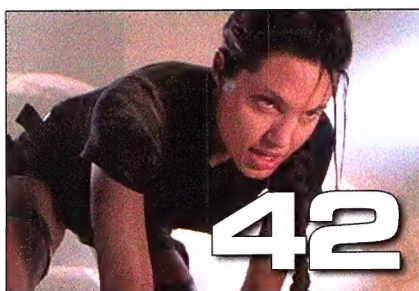
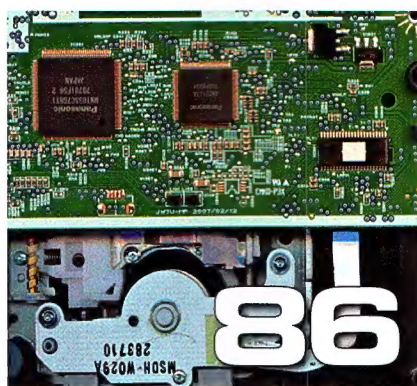
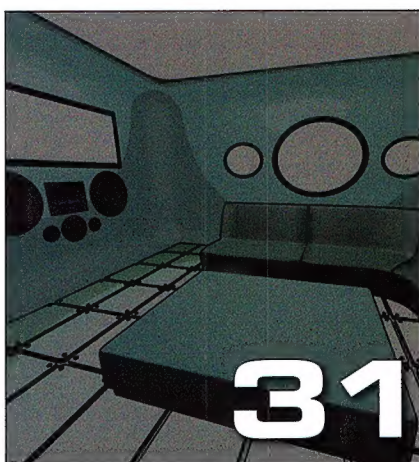
It's not the Nazis that are coming, it's the Russians! Well, at least that's what Logan Booker thinks.

Music in Linux, part 3 86

Leigh Dyer is still chipping away at his open source music machine, and you should be too. Continue with the third and final part of his comprehensive tutorial this month.

The perfect burn 90

Jake Carroll has a lot of experience with DVDs, CDs, Blu-ray discs and fridge magnets. We asked him to retell his experiences here, in detail, as long as he left out his magnet fetish.



REGULARS

LOGIN

Update 8

AMD's ATI division loses its CEO; Australian games industry needs funds!

Chat 13

It's Jonathan King, director of *Black Sheep*.

X-Ray 16

Kernel engineering. The only sort of engineering you should do.

Technica Obscura 20

Ashton Mills is against platform discrimination.

HARDCORE

How we test 40

So, like, hi and stuff, these are our benchmarks.

Gearbox 50

It's not the clutch. It's the Gearbox!

Kitlog 58

Mmm... kit. When you need that inspiration for your next purchase, look no further.

Ground Zero 60

Dan Rutter wonders if he could have the chance to defy physics, just like wireless antenna marketing say they can.

Hardcore reviews

Corsair XMS3 DDR3-1333 C9 52

Dell XPS 720 53

Intel Core 2 Extreme QX6850 54

Gigabyte GA-P35-DS3R 55

TEAM Xtrem Dark PC2-6400 C4 56

Kingston HiperX PC2-6400 C3 56

Antec TruePower Quattro 850W 57

Netgear HDXB101 57

GAMEPLAY

Geekette 82

So, you're a girl and you like games, that means you *have* to like these games.

Game reviews

Ninja Gaiden Sigma 72

Guitar Hero Encore: Rock the 80s 74

Two Worlds 76

Culture Shock reviews

Day Watch 80

Sex.com 81

Harry Potter & The Deathly Hallows 81

Afro Samurai 81

TECHNIQUE

Input Output 94

The man, the myth, the legend. It's Dan.

Hotbox 96

Modded, hot, sexeh, box lovin'

Fallout 98

Atomic Meet v7.0 – manhugs for all!

EDHEAD

Bombs away

Hardware. It's more exciting than marmalade. Especially right this very second. Yes, *this second*.

Intel recently slashed – nay, tore asunder – the prices on its Core 2 range. If you took a giant novelty dollar sign made of ice and blasted it with a battery of turbo lasers, the tiny shards of frozen water left in the aftermath would fail miserably to illustrate the extent of Intel's crazed cutting.

Take the quad-core Q6600. It's going for a sweet \$300, even less if you're lucky. It overlocks something fierce and, coupled with some tight DDR2 and an equally sharp P35 motherboard, proves a compelling purchase. I'm content with my overclocked Athlon X2 4200+, but the thought of having four delightfully powerful cores at my command is hard to resist. My will currently fights a battle of Midway-like proportions with my wallet, and that piece of ragged old leather has already lost an aircraft carrier and an entire wing of Mitsubishi Zeros. Damn those Americans and their sassy 'radar'.

Even if you're not currently in the market for a new system, keeping an eye on the actions of Intel and AMD is great for the entertainment value alone. It's been a long time since we've seen margins so small, with the fate of the latter company resting on the success



of its next line of CPUs. Here's hoping Barcelona gives AMD the boost it needs to stay in the war.

This month gave *Atomic's* newest tech writer, Josh Collins, a chance to flex his hardware muscles, as you'll see from the utterly perfect reviews in *Hardcore*. I'm pleased to say Josh has neatly filled the huge shoes left by Craig Simms, and if we're not careful, he's going to bust right out of them. And you know what the say about those with big feet.

Or so I've heard.

As always, this issue contains a bundle of excellence packed neatly in a box of awesome. We really wanted to tie it together with string from the twine ball of radness, but 'rad' went out of fashion about the same time Rick Astley did. Which is a while ago.

Of the features this month, our cover story on sex in games is the finest. Forget the cheesy and testosterone-pumped articles you'll find in other mags; *Atomic* is the first to take a serious look at the history and growth of computer games and sexual content. From the absurdities of yesteryear to the scandals of Grand Theft Auto, we cover everything.

Page 22 is where you need to go to start on this one.

Once you're done with that, the usual tastes of *Atomic* await you. My recommendation? The game-to-movies feature on page 42 will have you laughing. Must see *Double Dragon* soon...

Logan Booker
lbooker@atomicmpc.com.au

CORRECTION: Last month in Gearbox, we made a slight boo-boo with the name Anyware. Let's just say we spelt it a bit wrong. Apologies to the great people at Anyware (www.anyware.com.au) for the error, and thanks again for your tireless support!

Issue 78 winners: 5x copies of *Nerds FC*. H. Bradley, Canning Vale WA; D. Jones, Frankston VIC; T. Conduit, Morphett Vale SA; B. Maidens, Kelvin Grove QLD; B. Terry, Narre Warren VIC.

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Atomic: Maximum Power Computing is published monthly by Haymarket Media. Company registered in Australia (ABN 61 083 063 914). This publication may not be reproduced or transmitted in any form in whole or in part without the written permission of the publisher.

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Burned!

Jake Carroll delivers the low-down on the optical drive market.

Turbulent times lie ahead for optical storage, with DVD burners failing at an alarming rate in recent weeks.

The hallowed DVR series from Pioneer took a fall from grace, with major firmware problems in the DVR-112 PATA drive. LiteOn recalled 1000s of 20x units from circulation and BenQ officially left the market. The tier-three media manufacturers (Mitsubishi Chemical, Taiyo Yuden and TDK) have had quality control issues on a high percentage of export media.

Things aren't looking any better on the Blu-ray/HD-DVD front. Poor sales of the current half-height PATA/SATA drives and the lack of the promised combo units from Pioneer, Optiarc and HP has created consumer in confidence.

Sony gambled the farm on the success of the PS3 to kick-start the Blu-ray market. Even if Blu-ray manages to become the dominant HD format, the barrier to entry is so high that no consumer outside of enterprise storage or enthusiast markets would consider getting involved.

A saving grace exists. This week saw the release of LG's BDH-100 HD-DVD/BD combination player.

Gasp! Playing both formats in the same unit!

Won't somebody please think of the licensing laws? The Japanese giants are keeping their hands clean of such efforts, with Pioneer, NEC, Sony et al. nowhere to be seen with regards to a multi-format player. Samsung has announced a competitor to LG's effort, with the BD-UP5000 HD-DVD/BD player. This could be the beginning of a torrent of dual-format players. We need this.

Looking at more progressive markets, the Holographic Versatile Disk Alliance is on the move, with its newest specification being approved by the ECMA. The new 200GB/1.6TB specification can be viewed here: www.ecma-international.org/publications/files/ECMA-ST/ECMA-377.pdf.

Figure 1 shows the laser assembly being used in HVD drives. Notice the objective lens and rotating glass plate components (yes, the pickup head moves in three dimensions!) that differentiates the technology entirely from our current burners. The most interesting aspect of holographic recording is the way the data is addressed as 'pixels' on the data page. Gone is the concept of linear tracking and serialised pits for 0s and 1s. The bird's eye view of the OPU is shown in Figure 2.

The data held at each point can be

superimposed as a block of pixels, from the data page pattern shown in Figure 2, directly onto the recording surface in Figure 3.


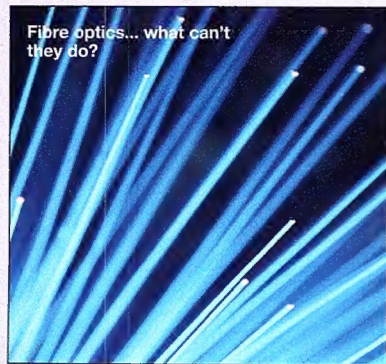
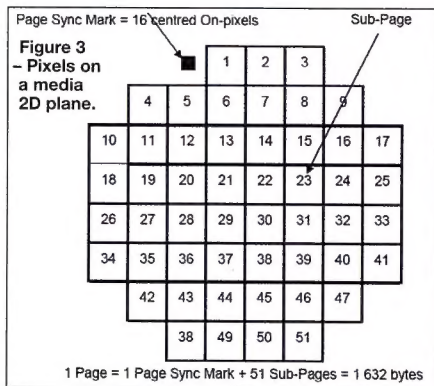
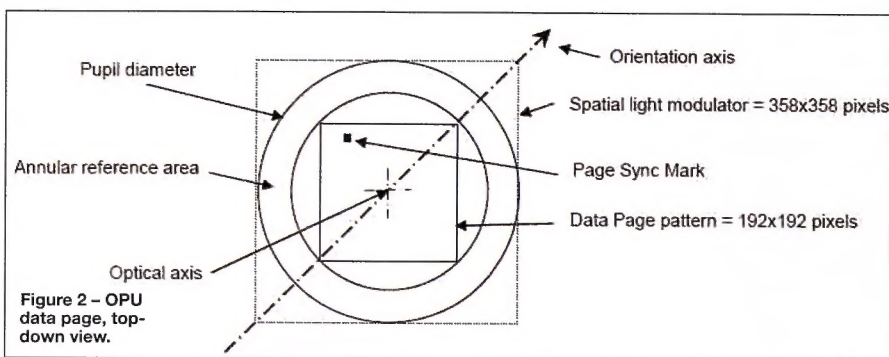
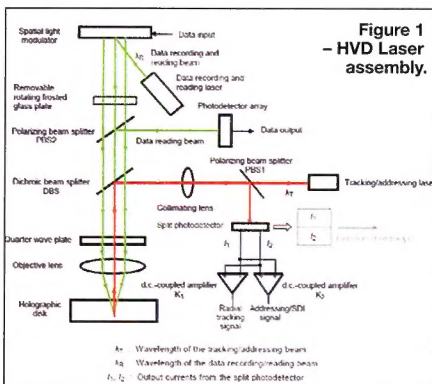
Before we even come to grips with 50GB Blu-ray, HVD has made it look insignificant. Scaling out to 1.6TB @ 120MB/s in the now commercially available Tapestry 300r from InPhase Technologies, this will be the next bit of hardware to care about in the optical storage wars. 

Figure 4 - The InPhase Technologies Tapestry 300r and HVD media.



Recently, Sigbritt Lothberg of Sweden, a 75-year old woman, was given access to the world's fastest residential Internet connection. The connection is rated at 40Gb/s, down a fiber-optic cable. With the potential to download a full-length HD quality movie in less than two seconds, the news has every torrent leacher drooling just thinking of the possibilities. We know we are. The real kicker in this story - Sigbritt only uses her connection to read online news papers.

Intel forced AMD between a rock and a hard place with further price cuts this month on its line of Core 2 CPUs. Recent reductions have made the previously expensive quad cores now cheap by anyone's standards - for example, the Q6600 sporting an RRP around \$340.

While consumers rage, PC lovers laugh, as Apple plans to charge admission fees to customers wishing to enter its stores. Its reason being it wants the 'right kind of people', further



Oz clocking

Josh Collins reports on Australia's OC attempts.

The Australian overclocking scene is growing strongly at the moment, and like the Australian sporting teams, we're taking on the world. Tim Marshal recently claimed the crown at the ASUS Overclocking Championships, hosted at the Funan Digital Life Mall in Singapore.

With ASUS the presenting sponsor, Kingston the head sponsor and co-sponsors Intel, FSP Group and A.C. Ryan, it was proof that overclocking, not only in Australia, but worldwide, is growing to a size that quite simply cannot be ignored anymore.

Carrying the weight of an overclocking nation on his shoulders, Tim Marshall, or T_M as he is known within overclocking circles, rose to the occasion to battle against the best.

Day 1 unfortunately saw Tim experience hardware failures, effectively putting him out of contention of the first day's prizes.

On day 2, making use of the cooling power of dry ice on both the CPU and GPU, Tim pushed the hardware to the very edge. With the Q6700 processor floating between 4.4GHz and 4.5GHz, depending on the benchmark being run, he nabbed some very impressive scores.

With a single GPU, scores such as 75,157 in 3DMark01 and 15,027 in 3DMark06, Tim combined extreme dry ice cooling and hardware voltage modifications to reach these scores.

On behalf of *Atomic* and the overclocking community, we would like to congratulate Tim on this great achievement – well done mate!

ATI head quits

Josh Collins sees dark skies ahead.

ATI CEO Dave Orton has left AMD, sending shockwaves through the industry and casting doubt on AMD's future. Beginning his goodbye speech with 'It is with mixed feelings that I am leaving AMD,' the bells started ringing and the conspiracy nuts started theorising as to what the 'mixed feelings' were.

With Dave Orton out of the picture, CTO Adrian Hartog has moved to replace him. Additionally, this change in the corporate structure has lead to Rick Bergman, head of

AMD's ATI graphics division, to report directly to AMD's Chairman and CEO, Hector Ruiz.

With one of the key players of ATI in the past now gone and the ATI graphics division reporting directly to Dr Ruiz, these are uncertain times for AMD and particularly the ATI division. Add to this the lacklustre reception of the HD2900XT and continued price cuts by Intel, further stressing AMD's share of the CPU market, and it's hard to remain confident of the company's future.

stating it wants patrons 'willing to pay just to see the latest wares'.

Gianfranco Lanci, President of Acer Inc. openly declared his, as well as the industry's, dissatisfaction with Windows Vista, stating 'the entire industry is disappointed by Windows Vista.' Not sure if he can speak for the whole industry, but his opinion does carry a lot of weight.

Rumours are that Seagate is packing up the bags on its IDE hard drive business.

Not at all unexpected given the dominance of SATA these days. The only question is: how long will it take for PATA sockets to disappear off motherboards? Judging from serial and parallel ports, a damn long time.

Running DirectX 10 games in Vista on an SLI rig and think the framerate is lacking? As unlikely as this situation is, at least right now, Microsoft has released a performance patch that makes sure the second GPU is actually doing something. Grab it here: support.microsoft.com/kb/936710.

FUTUREPROOF

Gazing into the crystal ball of tech

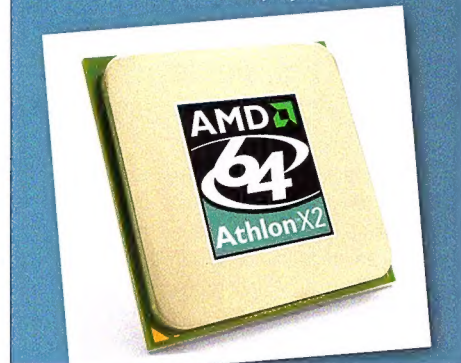
Fusion confusion

In February, the rumour mill was spinning with word that the Taiwan Semiconductor Manufacturing Company (TSMC) was to receive the outsourcing contract from AMD for its upcoming Fusion multiprocessing units. Now, the mills are spinning again, though this time with growing validity.

A report was issued by financial services firm JPMorgan, which stated confidence in TSMC's second quarter performance, and suggested TSMC may have secured the contract.

Additional news sightings that show the foundry is also capable of manufacturing on a 45nm platform, further leads to the likelihood of the Fusion contract.

With TSMC producing AMD GPUs on a 45nm scale and AMD stating that CPU manufacturing would not be outsourced, these events are setting the scene for the likelihood of TSMC producing the GPU side of the CPU/GPU Fusion project.



POST OF THE MONTH

Shake off the winter cold by taking a hot steamy bath in the warm springs of *Atomic*. Bubbles of concentrated yummy float to the surface of the *Atomic* tub, releasing the gaseous goodness in a powerful radius. Mmmm... toasty.

A special bonus thanks to everyone who posted in all the Meet 7 threads! So much *Atomic* loving, so many beautiful people. **POTM 81** though goes to a bloke who always warms us up, and this month did so with the caressing comfort of a hot water bottle.

It's rare to see Noddy post such epics, but when he does he shows his trump card as a master storyteller. His reality tales of everyday nothing take hold of you and take you away, there's nothing slushy about this tale. He is truly a natural.

Noddy's 65 minutes of nothing – an observation of people
www.atomicmpc.com.au/forums.asp?s=1&c=1&t=109945

And we hope for more nothing from the master of something. Logitech loves you too, champ, coming your way is a G5, straight from heaven.

Every Post of the Month wins a fabulous Logitech mouse from the brilliant people from Logitech... Huzzah!!!!



SCANNER

Game, industry and online news for the enthusiast

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Unequal opportunities?

Why don't game developers receive the same support as the film industry? David Kidd pulls out his logic probe.

The Australian film industry has a range of funding options from the State and Federal government, as well as special tax incentives for investors. In contrast, the gaming industry receives little in the way of federal support, instead relying on various small grants from state governments like Victoria and Queensland.

That's just not good enough, according to the Game Developers' Association of Australia (GDAA), who is calling on the Federal government to offer them same benefits as the film industry.

'If anyone invests a dollar into films in Australia they get 40 percent of that back as a rebate. The 40 percent rebate was also extended to the special effects component, but the game developers were all left out,' said Greg Bondar, executive director of the GDAA.

'The industry ... is growing exponentially, developers are coming up with new and creative products, and the problem we have is this lack of funding to encourage further innovation.'

The Federal government claims that the various film incentives already in place, as well as the establishment of a new, all-encompassing arts association, will have a positive 'flow-on' effect for the games industry.

'The new Australian Screen Authority to

be established in mid-2008 ... will be able to consider new measures of support for sectors involved in the development of games when considering broader industry priorities,' said a spokesperson for the Department of Communications, Information Technology and the Arts (DCITA).

Bondar doesn't buy it, however, saying that the film industry's tax incentives offer 'no benefit' to the games industry, and that any flow-on effect from the association will be 'minimal if not negligible'.

Industry veteran and director of Auran Graham Edelsten also wants Federal support, although he suggests alternative funding methods to tax incentives.

'I'd just like to see a fund that game developers could turn to, subject to a reasonable chance of success, to get their funding,' said Edelsten. The Federal government offers R&D grants, but because this doesn't allow marketing, developers will have no money to get their product out on the market.

A real pool of cash for game developers, says Edelsten, will allow them to 'finish their product and get the product out to the international distributors without having to sell their soul and sell their IP' to foreign companies – a common state of affairs for most fledgling Australian game developers.

While the Federal government has little in the way of direct support for the gaming industry at the moment, the DCITA is funding a report to look at ways of making the 'digital content' industry – which includes gaming – more attractive to investors. The report will form part of the Investment Scoping Forum, to be held later this year.

“The problem we have is this lack of funding to encourage innovation...”

SHORT CIRCUITS



Sierra Online has announced three titles for Xbox Live Arcade and PC. The first is an action space combat game based on the recent *Battlestar Galactica* series; the

second is *Commanders: Attack!*, a light turn-based strategy game in the *Advance Wars* mold; and the third, *Switchball*, is yet another roll-the-marble-down-a-hill game.

Three of the most overlooked strategy games in recent times are being wrapped up in a nice little triple pack, courtesy of Cenega and Ascaron. *UFO: Afterlight*, *Aftershock* and *Aftermath* form the new trilogy of games based on the mid-90's outrageously popular strategy and tactical hybrid, *X-COM*.

Turbine is working on a free mega update to *Lord of the Rings Online*, offering the usual bag of new quests, monsters, and a continuation of the main story arc. The update also includes a new 'Session Play' feature, allowing players to temporarily take on alternate characters (like a Troll or Ranger) for use in PvP, and the bizarre 'Critter Play' feature. The latter lets you play as an animal in the world (like a chicken), taking on specific quests and communicating with the world's other hairier, multi-legged denizens.



Auto destruct

NetDevil loses its baby, picks up another.

Auto Assault has gone belly up, with publisher NCSoft stating it will pull the plug at midnight on 31 August.

NetDevil's ambitious vehicle-based MMO struggled to gain traction – even launching a collectible card game to spark interest – but the destructible post-apocalyptic environment, combined with unique vehicle combat, wasn't enough to drag users away from traditional, fantasy-based MMOs.

But NetDevil's not down for the count, announcing three more MMOs coming up

next year. The first is Lego Universe, targeted at kids, families and brick fiends. Then there's the MMO FPS shooter Warmonger, which looks amazingly like Auto Assault without the cars. And finally, there's Jumpgate Evolution, an intriguing space combat sim based on NetDevil's first online game, Jumpgate.

NetDevil says Jumpgate Evolution will use a new graphics engine and focus on easier gameplay than its predecessor. Check out beta at www.jumpgate-evolution.com, or the original at www.jossh.com.

Space powered games

Space Siege and SupCom expansion from Crazy Chris.

Gas Powered Games has additions coming to its two main gaming properties. First up is Supreme Commander: Forged Alliance, due in November. It's a standalone expansion, featuring a new faction, single-player campaign, over a hundred units, and online compatibility with the original. We loved SupCom, and we'll probably love this.

What we didn't love from GPG was Dungeon Siege, but the upcoming Space Siege sounds like a winner. According to a vague press statement, you play the role of an engineer in the wake of an alien attack on

Earth. As the game progresses, you'll make decisions as to whether to use cybernetic implants and sacrifice your humanity, or conquer the game using good old fashioned brains and meat.

Do you turn yourself into a robotic warbot to squash the aliens, but run the risk of freaking out your fellow humans? Or do you resist the temptation and work alongside your comrades to organise resistance? Those kinds of options make this sound like the sexy spawn of Fallout and System Shock. More info: www.sega.com/spacesiege.

Steven Spielberg is working with EA on a couple of games, one for the Wii and one for multiple platforms. The Wii exclusive game is some kind of grab-bag of mini games for single player, co-op or competitive multiplayer. Over 100 games will be offered in the base game, or you can build your own with the in-game tools.

The second game is an epic action/adventure hybrid for PlayStation 3, Xbox 360 and PC, and just as you'd expect in a Spielberg movie, it focuses on a 'touching and ever-changing relationship between

you and a mysterious female character who holds the key to many futures.'

Electronic Arts CEO John Riccitiello says games these days are too boring, not innovative, and too hard. 'For the most part, the industry has been rinse-and-repeat,' he told the *Wall Street Journal*. 'There's been lots of product that looked like last year's product, that looked a lot like the year before.' If only EA had a big name movie maker to churn out some new franchises rather than, say, NFL and The Sims expansions.

PIPELINE Hot games to watch out for



Dark Sector

Release date Early 2008

Dark Sector has some kind of background story involving a catastrophe and an Eastern European town, but we'll just skip ahead to the part where you wake up with some gigantic, mutant, shuriken-like boomerang.

This all-purpose blade, called the Glaive, is what sets Dark Sector apart from the gun-juggling norm. You can use it as a melee weapon or you can imbue it with special powers like fire and electricity, then strategically taking out multiple enemies.

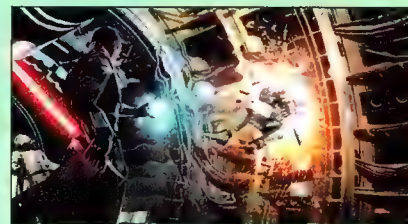
Although there are other weapons in the game, Dark Sector looks like it borrows heavily from Tron 2.0's disc-throwing mechanic, building on the concept in just the right way. Let's hope the multiplatform release doesn't result in any unhealthy compromises.

Platform PC, PS3, Xbox 360

Developer Digital Extremes

Publisher D3 Publisher

Web www.darksector.com



Star Wars: The Force Unleashed

Release date TBD

Star Wars: The Force Unleashed could become Star Wars shooter du jour. The story takes place in that murky bit between Revenge of the Sith and A New Hope, where you'll play as an apprentice to Darth Vader as he embarks on his genocidal rampage.

You'll have an arsenal of force powers to pick from and you'll deal with moral conundrums to determine whether you're a hippy Jedi from the light side, or as dark as the Darth himself. It's also touting a couple of technologies to simulate AI and environmental effects – Pixelux' Digital Molecular Matter engine and NaturalMotion's Euphoria technology – meaning trees will behave like trees and people will behave like people.

Platform 'Next-gen consoles'

Developer LucasArts

Publisher Activision

Web www.lucasarts.com

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ATOMICCHAT

Talking to the finest human beings on earth...



Who has the scarier face? Just kidding, it's the one on the left.

Jonathan King

Director and writer of horror comedy *Black Sheep*, Jonathan King speaks to Logan Booker.

atomic What was your inspiration for *Black Sheep*?

Jonathan King *Evil Dead*, *Braindead*, *Dawn of the Dead* ... you know, all the great 'dead' movies. Also *American Werewolf in London*, *Jaws*, *The Bird* and *Jurassic Park*. Basically, I wanted to make a movie from this fun, simple idea, filtered through all those movies I grew up on.

atomic Creatively, what were your goals for *Black Sheep*? Do you feel you achieved them all?

Jonathan King I do feel like I've achieved everything I wanted for *Black Sheep* – and more. I wanted to make a fun movie that made people laugh, jump and gag, and I wanted it to be seen by real audiences.

I guess I saw it creeping out across the world over a longer period of time than it's taken. I'm over the moon that it's getting a theatrical release in so many countries this year, though I hope and expect it'll live on, [in the form of] DVD for many years to come.

atomic How much freedom do you give your actors? Do you feel there's a place for spontaneity and improvisation in modern film, and if so, do you encourage it?

Jonathan King I absolutely feel there's a place for spontaneity and improvisation in modern film – you just have to know what to keep and what to throw out. I always had a very clear idea of what a scene or line or moment in *Black Sheep* was about and I pointed the actors towards it. But if they had a better idea or leapt to a cool new place on the back of where I was pushing them, then fantastic. I'm happy to take credit for anybody's good ideas!

atomic How hard is it to balance horror with humour? How did you approach the problem both creatively and from an entertainment perspective?

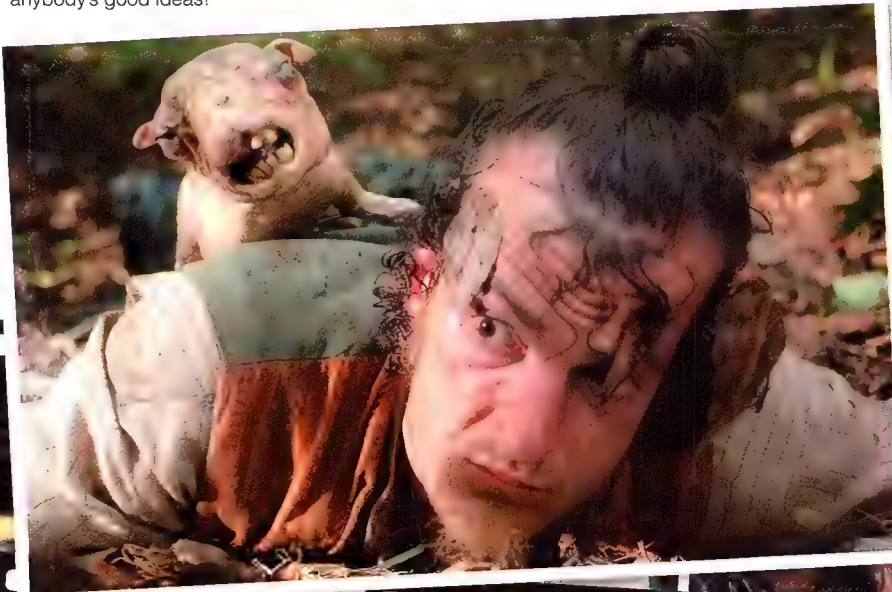
Jonathan King I really followed my instincts for what I thought was funny or scary and how they could play together. Many moments in the film balanced those things just as easily and happily as I hoped they would: A sheep ripping someone's lips off manages to be both at the same time – I think.

Having said that, there were other moments we discovered on set and, even more so in the edit room, that sometimes those things can't sit on top of each other or even too close together. My guide in those times was trying to really tune in to what I thought the audience wanted or expected to get out of that moment. Then I would play into that – or against it – to create a laugh or a scare.

atomic How much did the script, and the direction of the movie itself, change during production?

Jonathan King It evolved a lot as we developed the script, but it changed very little in production really. There were a couple of scenes up the front of the film that we shot but deleted because we wanted to get the story moving quicker. There was one night scene near the end that I deleted (and moved the best bits into another scene) during production because of the logistics of shooting at night. Again, that tightened up the film, so it was a good thing. Lots of moments, though, just got better and better when the actors played with them or we exploited the opportunities we had with the creature effects.

atomic How long did you spend writing the script? What did you find took most of your time (dialogue, makeup refinement)?





“ You always wish you had more time, more money, another go at shooting... or more testing. ”

Jonathan King It took about three years from typing the first page to shooting the first scene. The general shape of the story was there from the start, the time was spent evolving it into the best version of the idea we could – that meant characters we could follow for 90 minutes, the best laughs and the coolest scares. I wanted people to have as fun an experience as they would hope to when they first hear the idea!

atomic As far as Oceania goes, sheep are fairly iconic when it comes to NZ. Do you feel however that the symbolism may be lost on international audiences who may associate our woolen friends with countries such as Scotland (and perhaps diminish the humorous undertones we take for granted in the film)?

Jonathan King I think New Zealand and sheep go together in peoples' minds all over the world. And even if they do have different associations with sheep, they can apply what they know (and the jokes they make) to this film!



atomic Digital can be tempting for independent filmmakers looking for a cheaper option. When do you feel digital will overtake normal film?

Jonathan King I think the change will come pretty soon. While the savings are only a small percentage of the budget for bigger films, the best new HD technology can allow makers of smaller films to get high-quality images more cheaply.

The one thing we were conscious of with *Black Sheep* was that we definitely wanted to make a film, not a straight-to-DVD video ... but as the quality of digital options gets better it will be impossible to tell the difference before long.

atomic What would you say you enjoy more – writing or directing? Obviously both have their charms.

Jonathan King Writing is great – when it's going well! There's nothing more satisfying than creating something out of nothing. When it's not going well it's torture.

The great thing about directing is that you're always moving, creating and interacting with people – it isn't comfortable, but it's exhilarating. Editing is the most relaxed creative time on a movie. You're working with elements you already have and putting them together in new ways. It's (usually) a very satisfying time.

atomic In modern film, who do you believe has the most creative control over a project – the director, producer or writer? Why is this so and has this changed over the years?

Jonathan King It can depend a bit on the scale of the project, but probably the director. Certainly once the film has started shooting – the writer is

at the bottom of that list! If the director is trusted to achieve his vision or is accepted as a key part of the 'package' then they'll be the one with the most control. The more money there is at stake, however, the more likely the producer is to be the one with ultimate control – though, even in that situation, the director would be trusted – as long as he was delivering.


atomic In what ways does the New Zealand Government support filmmakers? How did they help you on *Black Sheep*?

Jonathan King The New Zealand Film Commission is a government funded organisation that finances films. They were very supportive of *Black Sheep* from a very early stage. They helped us make contact with international partners and ended up contributing a majority of our budget.

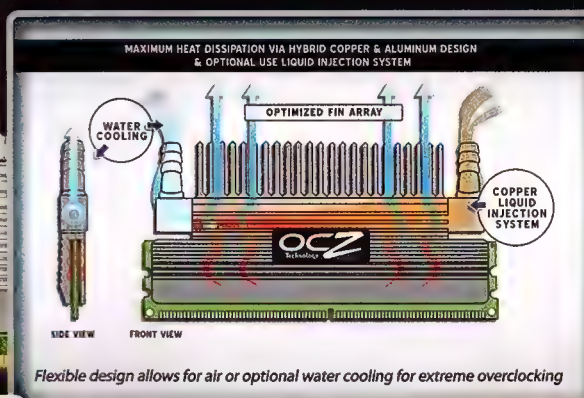
atomic In hindsight, is there anything you would have done differently in the film, say a particular scene, the levels of gore, development of characters, etc?

Jonathan King Not really! You always wish you had more time, more money, another go at shooting something or more testing before you shot. But we made the best of all the resources we had and I'm thrilled with the result. Next time I'll make a movie without animals in it!

atomic Any advice for new filmmakers?

Jonathan King Don't wait or hope for someone to come and give you a break or a dream gig – it won't happen. You make it for yourself. Make as much as you can. Write – or get someone to write – a great script: that's where movies come from. 

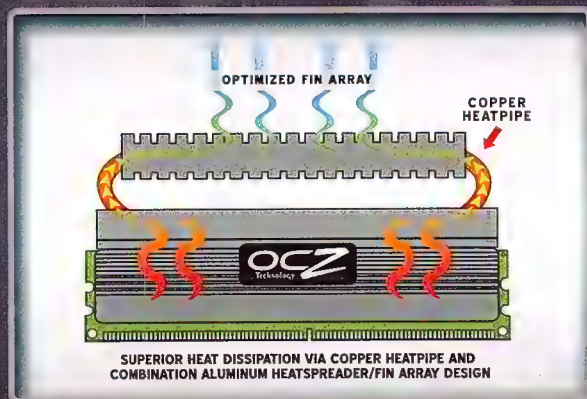
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Kernel engineering

The kernel is the heart of the operating system, and as a result is critical to its performance. Optimising it for the server or desktop environment is no easy task, as Ashton Mills reveals.

It's all too easy to think of Windows or Linux as operating systems that *just work* when we throw our demands at them. We know that both are designed to handle server and desktop

environments, and though logically you'd assume these to be contrary, under the hood the operation of the kernel to support them can be substantially different.

It's all about latency

If you think about it, for each and every slice of CPU time, your operating system can do only one thing. The magic that is multitasking is the brilliant management and execution of commands from multiple processes to run them, as seamlessly as possible, side-by-side. But when it comes to making sure an operating system performs as required for the two core environments of server and desktop, how the kernel does this makes all the difference.

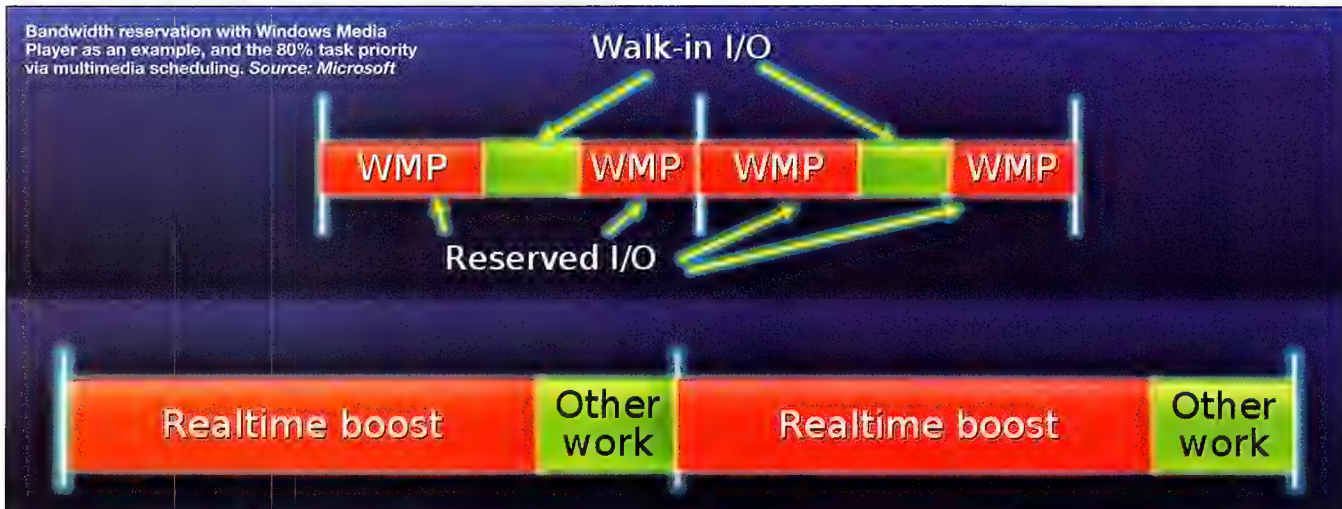
Microsoft has made lots of noise about the advantages of Vista. When you look under the hood at just the kernel changes you can quickly see how Microsoft has worked hard on the end-user desktop experience, and also the extent to which XP, and Windows versions prior to this, have all been slowly working on the problem. And that it still isn't completely there yet.

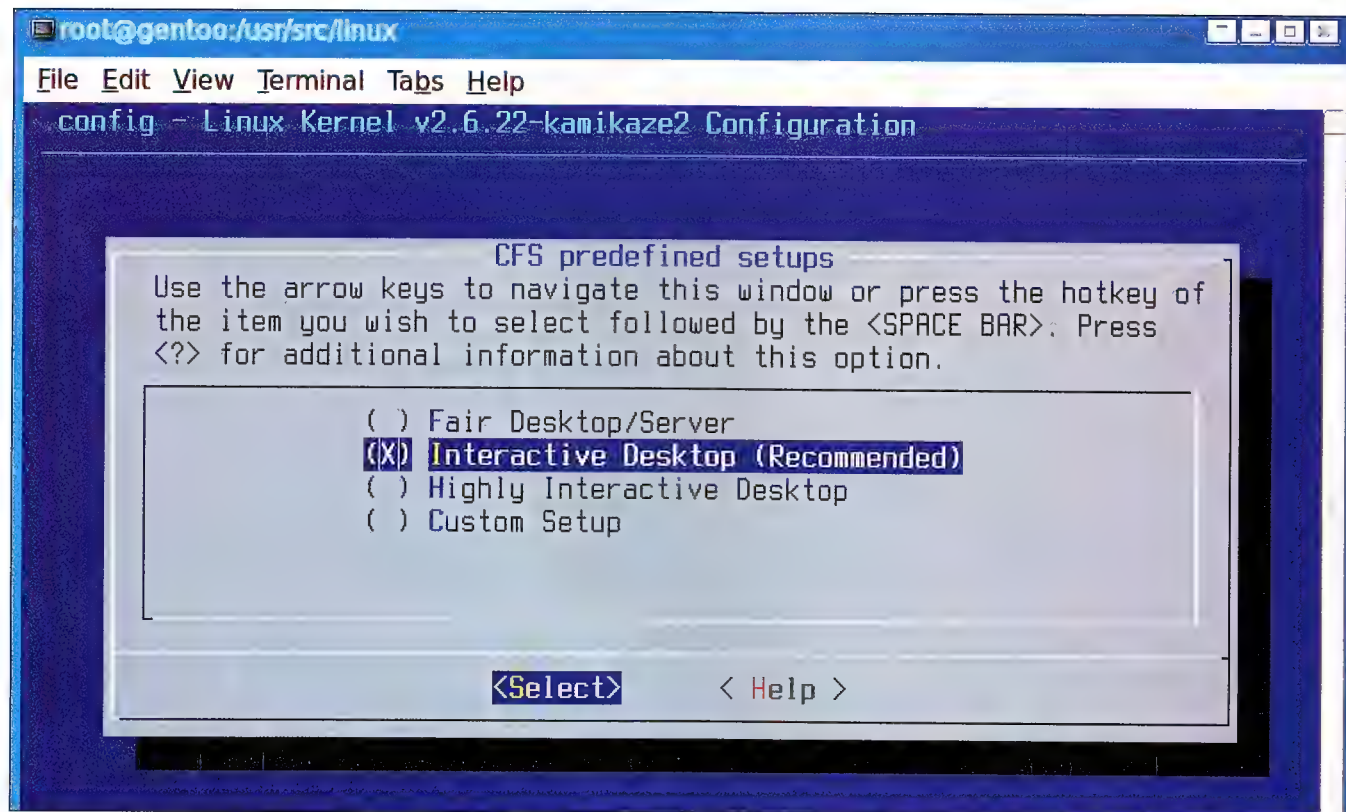
Linux is no different and, in many ways, is worse off. The brain boxes behind Linux kernel development are masters, but for almost two decades now the Linux kernel has been engineered and finely tuned for the market where it first got a foothold: servers. The focus in recent years on Linux for the desktop is great, and much of the work that's been done has been on the user space (witness Ubuntu and the many changes it makes on the desktop to make Linux accessible). But under the hood, all Linux distributions are still running a kernel that was essentially designed for a server, not a desktop.

This expresses itself in the problems some users face. For example, stuttering audio playback while accessing a disk, or slowed GUI window movement under high processor loads. The problem isn't that the kernel can't handle the workload, it's *how* the kernel has been designed to handle it.

It's a complex problem for Windows and Linux. How can you get optimum performance under both these two core environments when, for the most part, they are largely opposed?

There's a popular maxim that states server and desktop requirements roughly correlate to a sliding scale between throughput and latency.





▲ Configuring a Linux kernel – CFS and its default 'Interactive Desktop' setting.

Servers are big on throughput, while desktops are big on (low) latency. And the more you get of one, the less you get of the other. While this is true in principle, the issue can really be broken down to just latency, as lower latencies tend to equate to lower throughput.

For servers, throughput and getting work done is usually more important than latency, as well as ensuring that services (be it file, web, networking and so on) get their fair share of time in the sun. For desktops it's somewhat the other way around – low latencies mean responding quicker to the user, and giving some tasks higher priority at the expense of

others (effectively an 'unfair' workload) can mean a more seamless user experience where it counts.

Consequently, there is actually quite a lot that both Vista and Linux do at the kernel level to provide a better experience for the desktop user.

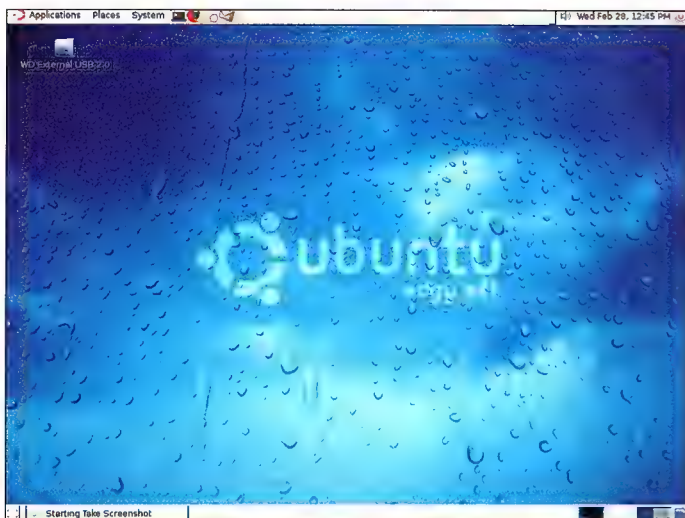
Vista

Microsoft is well aware that the Windows XP, well, experience didn't turn out to be quite the revolution it promised. In light of this, Vista's kernel underwent a number of upgrades to help change this, including:

Multimedia class scheduler service: A new service boosts thread priorities of multimedia applications to try and prevent glitches in video and audio playback. Threads are boosted for 80% of the task's clock rate, then dropped back to ensure other tasks can run.

IO cancellation: Many IO tasks can be prematurely cancelled, and this applies to network connections as well. So no more frozen Explorer when a network device times out.

IO prioritisation: Previously only CPU threads could be prioritised, but now



▲ Both Microsoft and Linux developers are working hard at improving desktop performance at the kernel level.

“Linux has come a long way in terms of user-friendly desktop-focused distributions. Unfortunately, as all of them still run the Linux kernel... they don't have heritage in the desktop space.”

certain IO-intensive jobs (like virus scanning) can be given a lower IO priority. There are five levels from Critical to Very Low. To ensure low priority tasks still get a look in, at least one low priority IO is processed every second.

IO bandwidth reservation: Similarly, some applications such as media streaming can request minimum bandwidth to ensure interrupt-free IO.

SuperFetch: Preemptively populates memory with data the kernel expects the user to need, thus providing faster response times, and uses IO prioritisation to ensure this doesn't interrupt the user.

ReadyBoost: You know all about this one. It's most beneficial for low-memory systems.

ReadyBoot: Analyses the last five boots and devises an optimised startup plan to reduce boot times. A RAM cache is dynamically built and destroyed on demand to facilitate this during boot. The end result is a snappier boot up, personalised to taste.

Parallel sessions: To further improve boot times, startup sessions can be launched in parallel during boot.

Delayed autostart: Some services have delayed start times, such as Windows Update, to allow faster logins. Again, these can take advantage of a low-priority IO assignment.

All this is rather nice if you're running Vista, and shows just how seriously Microsoft takes the importance of a faster and more responsive desktop experience.

Linux

Linux, as hinted at earlier, has come a long way in terms of user-friendly desktop-focused distributions. Unfortunately, as all of them still run the Linux kernel – which is certainly an efficient kernel – they don't have heritage in the desktop space. In recent years a stronger focus for the desktop has led to a number of changes. Some of these have been around for a while but have been tweaked, while others – like CFS – are brand new.

Preemption model: The kernel has three default levels: None, Voluntary, and Preemptible. None is ideal for servers and maximises throughput; Voluntary allows low-priority processes to preempt themselves to allow applications to run more smoothly while under load; and Preemptible is similar to Voluntary but with a response time in the milliseconds that's good for real-time systems.

Timer frequency: The default clock frequency within the kernel. The old 2.4-series kernels defaulted to 100Hz, but the 2.6 series has a wide range of options from 100Hz to 5000Hz+. The faster the timer frequency, the quicker the kernel will respond to interactive events. 100Hz is recommended for servers and 1000Hz is considered ideal for desktops. In typical kernel developer humour, the kernel configuration dialogs note that anything above 1000Hz is 'Insane' and anything above 5000Hz 'Obscene!'


CFQ: The Completely Fair Queuing IO scheduler is a relatively recent development and ensures balanced and fair IO access ideal for desktop systems. By comparison, servers will usually fare better with the Deadline IO scheduler, while the original Anticipatory scheduler sits somewhere in-between.

CFS: The Completely Fair Scheduler is brand-spanking new as of the 2.6.22 kernel and aims to address some of the CPU scheduling issues that can impede desktop performance. Despite its title, the CFS will actually prioritise some tasks to ensure a fast and responsive desktop and applications, however it also ensures that programs can never completely starve – just as detrimental to performance.

Re-nicing: Programs have always been able to be re-niced (Read: Setting the 'niceness' level, aka thread priority) in Linux, however some recent kernel patches have taken to automatically re-nicing the X processes to prioritise the Linux GUI, further improving desktop responsiveness.

As with Vista, these are just some of the changes under the hood and, especially in the case of CFS, still under development.

Looking ahead

The illusion of multitasking and responsive desktops are just that, an illusion. Even in the age of multi-core CPUs, these rules still apply. But as Linux kernel developers place a stronger emphasis on desktop performance, and Microsoft continues to evolve its focus on the same theme, we will see further changes to the heart of our operating systems to enhance the desktop experience, especially as new technologies (like high-definition media, security, new hardware peripherals and so on) evolve. 



▲ For both Windows and Linux, media playback is considered an essential user experience that must work well.

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Apples and oranges

Ashton Mills hates a bad port. And a bad chardonnay, we suppose.

Everyone has their preference – PC or console – and neither is said to be superior (I'm staying well clear of that debate). But hardware aside, the different markets give game developers an interesting conundrum, one I don't think they have fully embraced – creating content for both PC and consoles.

If you can expand your target market to include multiple platforms, you're simply going to make a lot more money. And when the code can be ported without much difficulty, which toolsets like Microsoft's XNA make possible, then you'd be all but silly not to do it.

But then there's the other side of the coin: The PC is not a console, and vice versa. While developing a product for the PC, Xbox 360 and PlayStation 3 may grant you a much wider market, it should never be forgotten that these are still *different* markets. And different markets require different products.

One of the first and single biggest complaints about Oblivion was its dumbed-down level-scaling and, worse, the clearly console-centric interface. Perfect for the Xbox 360, horrible for the PC. What was Bethesda thinking? Pretty simple logic, really: It was making a product, and regardless of the platform, that product should consistently appear and work the same on all platforms. To Bethesda, the console is just another form of hardware on which to run the game, and consequently, another market to sell to.

But the game remains static and consistent across them, which is entirely the wrong thing to do. You don't go selling cold air conditioning to Eskimos, even if it sells well in Australia.

There's a reason PC users threw a hissy fit and that one of the very first mods for Oblivion was an interface overhaul. Because PC users are not (usually) console users, because the PC is not a console, because the platforms are *different*. And as a result, so are the markets. Different platforms require a *different* game, capitalising and maximising the benefits of each platform. Doing so ensures maximum sales on each

platform, instead of turning people away because they got a game that is clearly a 'port' and not made specifically for the platform they use.

Logan's interview with Irrational's Jon Chey for BioShock in *issue 79* covered this brilliantly. In it, Chey explains how the BioShock development teams have been split into PC and console groups, and that the versions are developed independently. Most importantly, the PC

team tailors the game for the PC (maximising the use of the keyboard and mouse, for example) while the console team does the same for the Xbox 360. This could mean interface changes, balance, features, and even gameplay as appropriate.

This is the right way to do it, and although we've been told by Bethesda that it has 'learned' from Oblivion for Fallout 3, I have serious doubts it is treating the different target platforms as the different targets that they actually are.

There has never been – and I'll eat my shoes if you can prove otherwise – a single game that has ever been ported from console to PC and received a glowing reception.

There's a reason for this. Because a game designed for the console market is not a game designed for the PC market, and it just won't

wash. Cut and dried, really.

So here's my message to game developers reading this: Don't do it, don't even think it. Learn from Irrational, and recognise that *different* platforms are also *different* markets, and different markets require *different* products. This is basic economics. Do this, and you can be successful on three platforms, instead of just one.

In the meantime, I'm crossing my fingers for Fallout 3...

Ashton just won't stand for developers trying to make a quick buck. Goddamned hippy.

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“ One of the biggest single complaints about Oblivion was its console-centric interface ”



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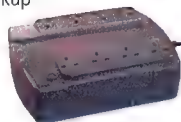
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SEX & GAMES

Primed with lubricant, James Matson dives headfirst into the world of sex and gaming, discovering that despite the censorship, controversy and regularly tragic game design, there's no pulling these two apart.

The greatest game of all time has been on the shelves for ages.

With more subscribers than World of Warcraft and a development cycle spanning millions of years, sex is the game everyone wants to play and no one wants to lose. Sex takes the best plays and gambits from real-time strategy and the heart-stopping action of a first-person shooter and mashes it all into a seamless multiplayer experience.

More than just our biological imperative, sex is an unrivalled form of communication, expression and interaction; one that most of us want fast, slow, hard, soft and often.

Video gaming – as a prime example of interaction tied up in entertainment – should gravitate towards sex with the ease of two lovers hitting each other up for sweaty action, but it didn't quite work out that way.

Sex and gaming spent the infancy of their relationship as cold strangers. While the sexual world now nests comfortably in film, literature and music, video gaming has long held it at arms-length, even as it embraced the dogs of war. Weigh up the last time you spilled blood while thrashing through the latest PC or console game, versus the last time you loaded up a title containing pixilated sex toys. Violence has been a part of gaming since we first laid the smack down on aliens in Space Invaders, but digital sexuality took longer to reveal itself due in part to early gaming history being the domain of kids.

As games transitioned from arcade boards into our lounge rooms, via early entertainment units like the Commodore 64 in the '80s, the gaming scene was largely the forté of children. The Interactive Australia 2007 study revealed the average age of the Australian gamer today is 28, but that same adult was likely a joystick-thrashing child of the '80s, a demographic

without the hunger for sex games.

Despite an entertainment medium built on a generation of children, in 1982 a software company called Mystique became a misguided trailblazer, birthing a string of adult video games including one of the most bizarre in history: *Custer's Revenge*. Released for the Atari 2600, *Custer's Revenge* put simulated sex in a context that crossed all boundaries. Playing as the American civil war icon General Custer, you traversed the screen in only boots and holster – all three pixels of penis visible – while attempting to dodge obstacles. Your reward for completing the level consisted of having your way with an unwilling Native American girl tied to a post.

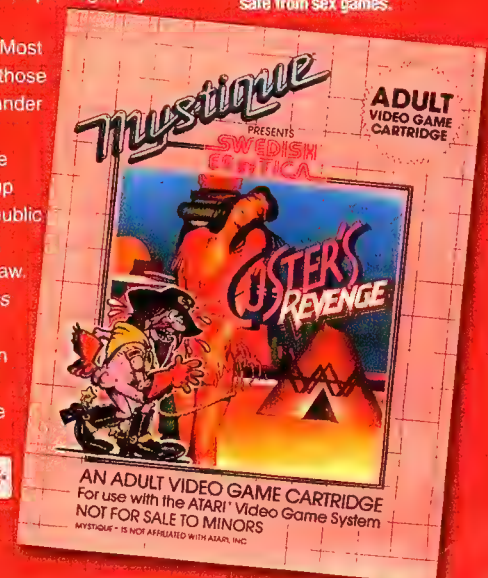
With rape the reward for level completion, *Custer's Revenge* became a footnote to bad taste, drawing widespread criticism from women's rights groups, anti-pornography groups, Native American community organisations, and the public at large. Most stores refused to stock the game and those that did served it surreptitiously from under the counter.

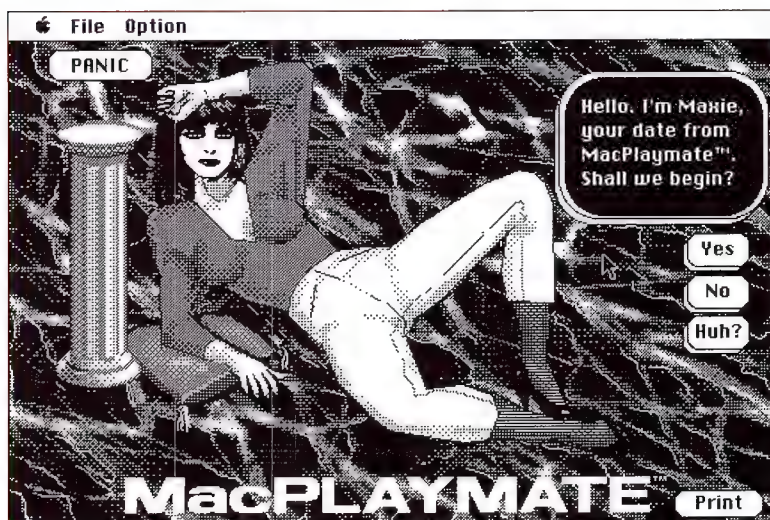
After the abortive efforts of Mystique Software, it's amazing we didn't shut up shop there and then, but the gaming public – playing the perfect voyeur – watched, waited, matured and liked what they saw.

The text adventure *Leather Goddess of Phobos* (circa 1986) gave fans as much raunchy suggestion and titillation as a non-graphical environment could allow, as players attempted to save the population of Earth from being turned into mindless sex slaves.

Then, in 1987 *MacPlaymate*

Below: *Custer's Revenge*, proving that even the humble Atari 2600 wasn't safe from sex games.





Top With monochrome graphics offering you alternatives of grey or white, black hair suits Maxie just fine.

came to the incredibly un-sexy MacPlus platform. It was part of a genre colloquially dubbed 'Poke the doll' due to simulating sexual interaction via your cursor – *MacPlaymate* had players wielding everything from the vanilla vibrator to the 'Mighty Mo Throbbin' in the quest to satisfy an on-screen girl.

In the same year *Leisure Suit Larry in the Land of the Lounge Lizards* brought players a unique brand of cheeky innuendo, combining lewd suggestion with tame sexual imagery. By packaging sex in cheesy characters and comedic situations, *Leisure Suit Larry* managed to explore sex while attracting gamers perhaps too embarrassed or uncomfortable to fire up more explicit games like *MacPlaymate*. The series proved vastly popular spawning seven sequels by 2004, with a mobile version currently in development.

While fun, oddball and occasionally disturbing, these early games weren't particularly arousing.

There were elements of delight to playing them – the naughty buzz that comes from participating in anything lewd – but beyond that did little to arouse the player. The human mind is a device of imagination, but these early forays into video game sex didn't plant the right seed to leave us panting. In essence, the world was coming to terms with the fact sex games could exist – but by virtue of the technology available couldn't make them truly exciting. But all that was about to change.

Girls who are boys, who like boys to be girls

The edge-dwelling sex games of the '80s taught us one sure thing: A market existed for sexy games. But even as a new decade dawned, adult themes tiptoed subtly into the digital world. While no one argues the fact we love sex, there was always a zealous fight to keep sexuality locked out of popular culture to protect our kids, our families or our moral fabric.

While this makes it harder to push obviously sex-themed games out to the public, developers have managed to engender a sense of the sexual in games without having to show a single nude scene or genital Fresco, thus circumventing angry mobs.

With gaming hardware continually advancing into a more powerful canvas, players and developers embraced the sexiness of the human form in gaming, providing titillation while keeping literal sex out of the equation.

Beat-em-ups started making appearances through the '90s and brought with them a glut of playable characters whose avatars and actions highlighted an intriguing mix of sex and violence. Here was a genre that cast players as burly guys beating up little girls (and vice versa) and same-sex wrestling against a backdrop of domination and subjugation. Whether in the guise of Chun-Li's shiny thighs peeking through a hybrid geisha costume or the rippling muscles of Guile; the same traits that create a 'sexy' character in other mediums gathered a foothold in interactive entertainment.

Core Design's *Tomb Raider* circa 1996 took character design up several notches using a then-stunning 3D engine to give substance to the now-legendary Lara Croft. Lara was not only a perfectly sexy game model, but one of the first mainstream playable female heroines. Waves of players brought up on male-centric characters were being given a female to control in-game – not as an option, but as the only choice.

We weren't just rescuing Princess Zelda anymore. Instead we became a female character whose acrobatic moves and powerful onscreen presence were anything but princess-like.

This opened up a whole new realm of exploration as players experienced a popular video game as a strong, attractive and plot-central woman. For guys in particular, Lara was a window into the ever-present fantasy of being a woman for a day, the sexual limits we employ in reality becoming fragile in the world of polygons and texture maps.

The A-list of gaming hotties



Name: Lara Croft (Tomb Raider)

Famous for being a game character so anatomically disproportionate, she had to be played by the equally disproportionate Angelina Jolie in the movie spin-off.



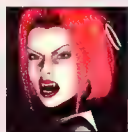
Name: Max Payne (Max Payne)

As much the product of a good storyline as typical male hero looks, Max has film noir quality mingled with the phallic overtones of a pump-action shotgun.



Name: Chun-Li (Street Fighter)

The Japanese know-how to craft beautiful game characters and Chun-Li is ample proof, rolling sexy, tough and cute into a silky blue qipao.



Name: Blood Rayne (Blood Rayne)

If there's anything un-sexy about a vampire wrapped up in spandex and wielding a huge set of steak knives, we haven't discovered it.



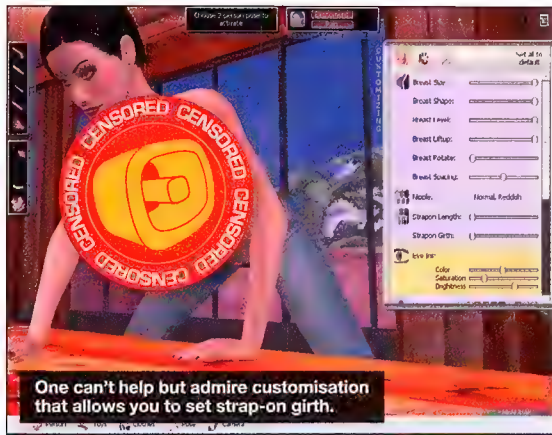
Name: Gordon Freeman (Half-Life)

An eclectic mix of chiselled good looks and 'Revenge of the Nerds' spectacles, Gordon Freeman is the modern hottie. Alyx agrees.

Name: Duke Nukem (Duke Nukem)

The perfect square-jawed, masculinity-oozing beefcake. 'Come get some!' indeed.





Fleshlight on the future

Despite a trail of poorly-designed sex games interspersed with occasional greatness and the ever-present shroud of censorship, the current landscape of sex in gaming is as bountiful as it is bizarre. Riding on the back of online distribution and growing public interest we're faced with an increasingly broad selection of sex-themed games.

At the bottom of the innovation barrel are the no-brainer titles that shove sex (and little else) in a box and throw it out the shelves. Games like *3D Sexvillia* by ThriXXX Software – a modernised version of MacPlaymate – allow the player to set up and animate slippery scenes of pixel penetration. Viewed as interactive pornography, *3D Sexvillia* is reasonably arousing, but the problem stems from ThriXXX touting it as a computer game, when it's clearly anything but. Risk and reward, something at the heart of any game, is non-existent here. You can't lose, no matter how inept you are at simulated foreplay. The women don't give up on you, get dressed and leave and the blokes maintain their erection no matter how little you stimulate them.

Further up the evolutionary ladder are titles injecting sex into established genres. This is where territory gets dangerous but potentially rewarding. *God of War*, and more recently *God of War 2* for the PlayStation 2, pulls this trick off with ease, presenting sexual content and NPC nudity without feeling like it was arbitrarily tacked on. As a player, you're well aware the game would be a madly fun hack'n'slash affair with or without bare-breasted women, but their inclusion adds weight to the hedonistic atmosphere of a game soaked in Greek mythology.

No justice would be done without paying out on uglier attempts to include sex in an established game format, and there's no shortage of them. *BMX XXX*, a cross-platform

Sex, coffee and the OFLC

Censorship goes hand in hand with sexual content. In Australia, it arrived in the form of the Australian Office of Film and Literature (OFLC) video & computer games rating system created in 1994. Though catering to ratings from G through to MA15+, any game deemed in the 18+ category because of sex, violence, drugs or other adult themes is given an RC rating (Refused Classification), prohibiting sale. Here's a rundown of games that landed on the OFLC's hit list.

Night Trap – Released in 1992 on Sega CD depicting quasi-sexual violence in the form of the capture and blood-draining of young women, *Night Trap* was instrumental in the formation of the OFLC despite being given an MA15+ rating.

Sierra's full-motion video (FMV) horror game *Phantasmagoria* released in 1995 earned an RC status for a graphic rape scene between husband and wife. While the OFLC pointed out the narrative indicated the husband was under the influence of 'evil forces' as he committed the act, guidelines left no room for contextual justification.

With a conceptual link between sex and violence in the form of driving a prostitute to a park, shagging, then beating seven shades of pixelated crap out of her and taking her money, *Grand Theft Auto 3* was refused classification in 2001, but later re-released with the prostitute scene omitted and an MA15+ rating.

Despite prostitute-bashing akin to *GTA 3*, *Grand Theft Auto: San Andreas* passed with an MA15+ rating. That freedom was short-lived after a disabled sex mini-game was found in the title and the 'Hot Coffee' mod released to unlock it. The graphic scene was enough for the MA15+ rating to be revoked, and the game was ripped from shelves.

Leisure Suit Larry: Magna Cum Laude was refused classification in 2004 on the basis of implied 3D sexual activity as a reward. Likewise, **Singles: Flirt up your Life** joined the latest Larry game in distribution exodus after also being refused classification in 2004 for using sex as an in-game reward.

There's a paradigm of conflicting messages for RC rated games, something which highlights the glaring omission of an R18+ classification. Promoting the genre online, however, largely bypasses the hurdles faced by the censorship laws and retailer standards in place.

Brenda Brathwaite, lead designer of *Playboy: The Mansion* for the PC and professor at the Savannah College of Art & Design, says that difficulty in selling sexually-themed games has weighed heavily on their development and the shift to the Internet as a means of distribution.

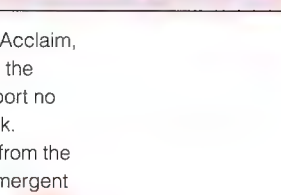
'I think the reason you see less sex games is that it's difficult to sell sexually-themed titles particularly if they're hardcore. You can't put these games in Target, so they have to be sold online through independent shops.'

Brenda is quick to point out that regardless of restrictions, a mature market is developing.

'As traditional media embrace games as something not just for kids, we're getting more coverage. *Playboy* has a column on gaming, and other magazines and websites are following suit. When porn stars like Jenna Jameson and Ron Jeremy (who has a line of sex mobile phone games) get into the act, you know gaming has hit the adult market.'

console game developed by Z-Axis and released by Acclaim, is all about strippers riding dirt bikes. Seriously, that's the entire premise. It does naked women and the BMX sport no favors, being a sub-par game with nudity a weak hook.

The real excitement, however, lies not in titles built from the ground-up to include sexuality, but those featuring 'emergent sex'. Emergent sex occurs when players develop sexual relationships and behaviours inside a game





Above Mash your PS2 controller the right way in *God of War 2* and these lovely ladies will reward your orbs – or something to that effect.

Above right Teledildonics will ensure no geek has to ever feel lonely.



environment – typically online – that was never explicitly designed for it.

It's not new – emergent sex has been happening since users first went adventuring via MUDs (Multi User Dungeons) back in the 1970s, but the explosion of graphically rich and impressively interactive MMO titles has proved fertile soil for emergent sex. While someone can happily level their Troll Priest to 70 in *World of Warcraft* completely bypassing any sort of sex play, they can make use of built-in emotes like '/dance' and '/flirt' with other players to make sexual advances. From there, players can engage in cyber sex via chat or enacting scenes with their avatars, finally taking the relationship onto VoIP software and eventually the real world.

The ridiculously popular persistent online world *Second Life* is a grand example of emergent sex. Unlike the more rigid confines of standard MMO games, *Second Life* not only allows freeform communication, but freeform creation. Users can create anything they want inside the environment, like houses, cars and even body parts. You can see where this is headed. People have been madly designing dildos, bondage equipment and orgasm animations for use within *Second Life*. Residents have even built brothels where players can work as hookers, paid in *Second Life* currency to service the whims of others. All this serves as concrete proof that people want sex in games, even if they have to make it themselves.

Sexual expression in online worlds is a sliding scale, however, and while there's fun to be had there's a tangible dark side. Give people the tools and freedom to act out fantasies in a virtual world, and concepts like rape and underage sex crop up. *Second Life* players have constructed

private clubs with names like 'Jailbait' where users can play out fantasies with facsimiles of children, while other multiplayer online worlds like *Sociolotron* accommodate rape and forced prostitution in a player versus player setting from the moment you sign up. Moral questions about how we deal with virtual rape or pedophilia begin to surface and mental harm via online sexual assault becomes a bona fide risk. *Custer's Revenge* seems a universe away.

Humans aren't even content leaving sex and gaming behind the screen. The relatively new field of 'Teledildonics' focuses on mixing sex toys with configurable software like computer games, allowing interactive entertainment with actual physical stimulation.

At the commercial end of Teledildonics are devices like the Interactive Fleshlight, a USB-connectable 'vaginal sleeve' that, while an obscenely fun sex toy all by itself, takes on an extra dimension when you plug it into your PC. Games like *3D Sexvilla* are actually geared to respond to your voracious thrusting into the Fleshlight; with the appropriate software loaded, the girls squeal in time with your intimate poundings.

Captivating and disturbing in the same breath, you can even link the Fleshlight and its female companion the Simulator over the Internet. With a name like a reject Transformer, the Simulator can respond through vibration to the thrusting motions made by someone into the Fleshlight while a layer of interactive software serves up the visual stimulus in-between.

If you're too strapped for cash to afford the \$150 asking price of the Simulator or Fleshlight, electronics engineer and self-professed pioneer of Teledildonics, Kyle Machulis, can probably help out. Running the sex and technology website

Below *Second Life* is all about freeform expression, with freaky low-poly nude people.

Below right Leisure Suit Larry: Magna Cum Laude took the time honoured lewd traditions of the Larry series and added 3D boobs to the mix.





slashdong.org. Kyle outlines various home Teledildonics projects to turn innocuous devices like the PlayStation 2 controller into a workable sex toy. Armed with a Dremel, a motor and a wad of epoxy, it's possible to turn your console bits into viable sex toys, receiving and sending vibration data between players. Next time you lose your PS2 controller, begin to seriously question just where it might be.


Kyle acknowledges Teledildonics is only getting started, 'Right now most new toys (including what I build) are just implementing new ways to control vibration. We need things that move, squeeze and thrust, in an affordable and small package before we really see Teledildonics taking off.'

The climax

Sex in gaming is rapidly picking up pace, with developers paying heed to the obvious market for the fun and arousal factor sex can create in games. It may be true that that no amount of sexualised entertainment will ever beat genuine human contact, but fun and escapism in games can be complimented by sexuality quite neatly.

Technology as a whole now embraces sexiness. Computers aren't boring beige, they're shiny works of art whose accessories are advertised by beautiful semi-naked women wearing strange fantasy armor. As a medium on this platform of sexiness, games are more than capable of delivering erotica inside conventional genres in a manner that magazines and movies can't match.

Fundamentally, erotica-based MMORPGs are surfacing online, while in the opposite direction porn films like *Whores of Warcraft* are mixing sex and the fantasy mythos of computer games together with crazy results. The future of Teledildonics may well take the form of sex robots, equipped with sensors that bend to a radius as small as two-hundredths of an inch – flexible enough for any movement a humanoid finger can make.

Like any couple that's been together a while, sex and gaming are ready to get kinky and weird to keep things fresh. Don't doubt for a second that we're watching, waiting and excited to the point of seizure as to what's going to happen down the track. 

Above left Singles: Flirt up your life – unlike many other adult games – makes you work at building a relationship with someone before you get to the sweaty stuff. **Above** *Second Life* lets you be who you want, act out any desire, and wear the most hideous representations of lycra ever to hit a pixel.

Below left The *Whores of Warcraft* adult film proves that the sex injected into games can come right back out again.

Below The stunning combination of a 'Butterfly' sex toy, circuit board and a 9600b/s serial connection to your PC results in stimulating vibrations controlled over the Internet – so we've heard.



LOUNGE ROOM LOVE

Adam Turner steps us through the first part of his guide to building a custom home theatre box.

A HTPC needs to be at one with its environment, so think carefully about what you expect from it and where it will live

Sleek, sexy, powerful – the ultimate home theatre PC is a thing of beauty. Too bad there's no such thing.

The 'ultimate' home theatre PC doesn't exist because the best lounge room companion is a compromise of size, power, features, heat, noise and aesthetics.

Handcrafting the beating heart of your digital lounge room takes great care and consideration.

Designing your own HTPC isn't that simple if you stray beyond the standard desktop and tower casings. Most of the so-called media centre computers from multinational PC vendors use butt-ugly mini towers that are unlikely to get that crucial 'Spousal tick of approval' for residing in the lounge room. If you're after a pre-configured HTPC, consider the likes of local box builders Altech, Enspire and Pioneer for something that looks the part. If you're looking for a barebones system, GIGABYTE, ASUS and Hiper have sleek models worth considering.

When designing a slice of home entertainment nerdvana from scratch, start with the case. Don't make any assumptions when it comes to what will fit within. Check the measurements of every last component before you buy anything – and still be prepared to make at least one red-faced trip back to the shop carrying that graphics card or CPU fan you had your heart set on, but is just a millimetre too big (sadly a Dremel can't always save the day). For this reason it might be better to buy most of your components from your favourite store, whether it be online or bricks and mortar, rather than shopping around for cut-throat prices. Along with offering good advice, a store is far more likely to exchange parts for a loyal customer.

Case in point

A HTPC needs to be at one with its environment, so think carefully about what you expect from it and where it will live. Measure your home entertainment cabinet carefully, allowing a margin for ventilation and the possibility of drilling holes in the back for extra ventilation and cables. If you like to tinker, it's probably easier to just rip the back clean off the cabinet so you can get at everything more easily – but remember you're also letting the noise escape.

When choosing a case, start with the usual suspects; Antec, Zalman, SilverStone, Thermaltake, Cooler Master and Accent. All make home theatre cases that might look at home in your humble abode. Are you after something big and beautiful that looks like an amplifier, or small and sleek that resembles a DVD player?

A row of flashing lights may appear cool at first but will soon grow annoying when you're watching movies in the dark. We're looking for a sleek AV-style desktop case that will blend in with our AV gear. Remember you have to look at this case every day, as do the people you live with, so a little consultation and compromise up-front could save a lot of anguish later.

If size is of little concern then add Zalman's beefy HD160 (\$400) and SilverStone's LC16M (\$289) to your short list, both are quiet cases that feature a remote control, two-line Vacuum Fluorescent Display (VFD) readout and memory card reader. If money is also no object, think about the Zalman HD160XT (\$800) or SilverStone C18 (\$879) with their insane seven-



Below Fertile ground for our new custom HTPC.



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inch LCD touch screens built into the front. Put aside more cash for a PSU.

If your lounge room cabinet and your budget are smaller, Antec's sleek Fusion (\$299) is highly respected as a quiet case. It features a two-line VFD, volume knob and a 430W PSU. If you're on a tight budget, Antec's NSK2400 (\$150) is the same case but with a 380W PSU, no volume knob and no VFD.

We don't think much of VFDs as they're impossible to read from the couch. The new, large-text LCD readouts are far more lounge room-friendly, so we opted for the Antec NSK2400 and diverted the savings towards a sexy SilverStone MFP51 LCD readout. It's a rebadged SoundGraph iMon OEM Type A, a 96 x 16-pixel LCD that is Windows Media Center-compatible and comes with an impressive remote control. You might not be able to buy them in Australia yet (ours was shipped in especially) but they sell for around US\$100. Obviously it's a luxury that can come later if necessary.

Of course, not long after our case and LCD arrived, Antec released the Fusion Black with an LCD rather than VFD. As with building any PC, you can do all the planning and research in the world but someone is always going to release something better the day after you hand over your hard-earned dollars.

If you're planning to keep your HTPC in a cabinet, the precise case measurements are vital. You might have some leeway in height and depth, because you can usually move the shelves and/or cut a hole in the back of the cabinet if necessary. Width, however, is critical. Home entertainment cabinets are designed to cater for AV components such as DVD players, VCRs and amplifiers – which are generally no more than 430mm wide so you'll be lucky to get more than 445mm to play with.

When measuring your cabinet allow for door hinges or anything else that might get in the way. Remember you'll need some ventilation space to ensure your PC stays cool and quiet. Consider the position of the PSU and case fans – if they're at the front of the case they'll need to work hard to suck air from the rear of the cabinet.

Finding the perfect home entertainment cabinet is a quest in itself. If you have little kids, think about something with doors on the front to protect your valuable gear from tiny hands. Remember doors could add to your ventilation woes, so consider building a fan into the cabinet. Be wary of cabinets with overhead cupboards and fixed sides, as they restrict the size of your next television – prices and circumstances change so don't assume you'll never own a widescreen giant. Think about how many other AV components you need to fit into the cabinet, and where you'd fit a centre channel and front speakers if you get surround sound.

Once you've found your home theatre cabinet and the HTPC case of your dreams, you need to weigh up



Shuttle makes some of the sexiest home theatre boxes in the universe, but like all cases, they're a compromise.

the case's pros and cons to see if you can live with the compromises it will force you to make. Don't buy anything until you've settled on every component, or that dream case could become a nightmare.

The most obvious limitation of a case is the motherboard form factor – if you have your heart set on an Antec Fusion and the latest ATX mobo then we see disappointment in your future. The quest for a small case may force you to turn to a micro-ATX board and even low-profile components such as the graphics card, TV tuner card and CPU fan.

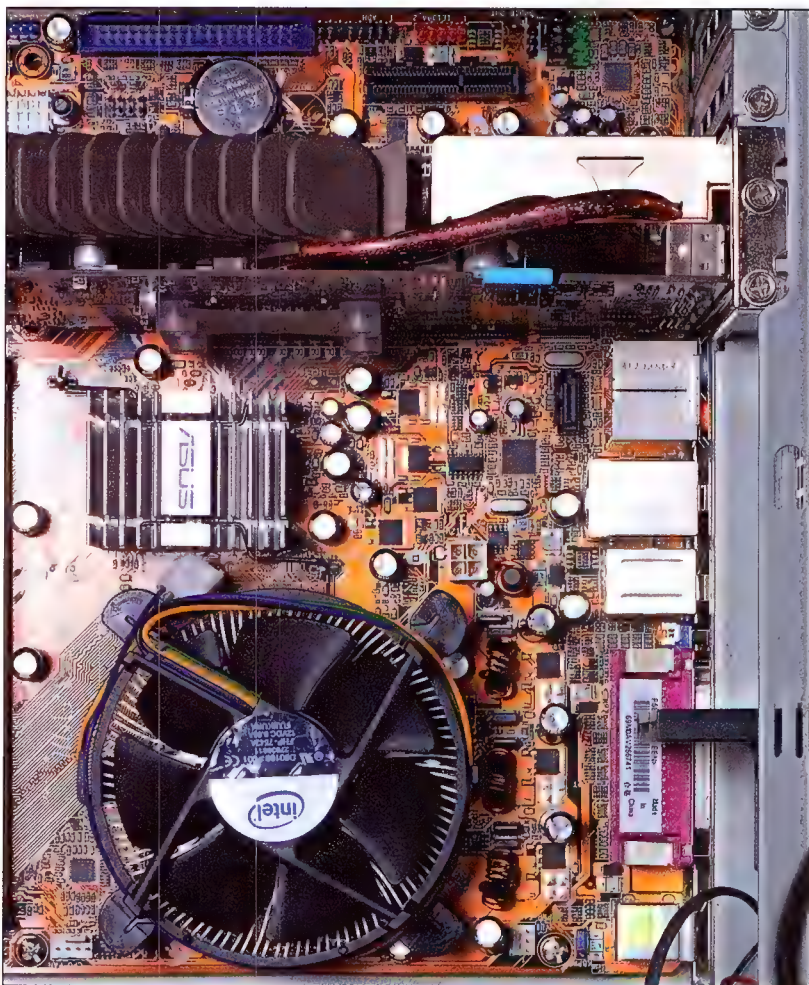
While the thermal advantages of Intel's BTX and micro-BTX motherboards would seem to make them well-suited to HTPCs, the form factor hasn't taken off. There are BTX HTPC cases around, such as the SilverStone LC15, and micro-BTX cases such as the Thermaltake Bach Sx and Cooler Master CM Media B260. Taking the BTX road could limit your options further down the track so do your research (start at btxformfactor.com).

An ATX motherboard will obviously make your life easier. When it comes to height, the Thermaltake Mozart SX (\$229 or \$349 with VFD and remote) is about the smallest ATX-compatible HTPC case that takes a standard PSU. The case measures 90 x 470 x 440mm, but at that height you'll be restricted to low-profile components; and at that width you'll struggle to fit it in a cabinet.

Other small ATX cases include the Zalman HD135 at 135 x 425 x 435mm (\$440) and the SilverStone LC04 at 115.5 x 420 x 309.4mm (\$200).



The quest for a small case may force you to turn to a micro-ATX board and low-profile components, like graphics, tuner and CPU fan.



Even Intel's stock offering only has a few millimetres to spare in the Antec NSK2400 case, so choose your heatsink carefully.

Cases and motherboards often negate each other, so consider your needs and potential upgrade path before making your decision.

SilverStone's GD01MX at 170 x 430 x 430mm (\$279) features the MFP51 LCD rather than a VFD. Again, allow some extra cash for a PSU. If you're struggling to find the right dimensions. SilverStone probably offers the widest range of options.

Just because a case matches your desired dimensions doesn't mean it fits your other criteria. Do you want a memory card reader? Front USB/FireWire/audio ports? More than one external 5.25in bay? More than two

internal 5.25in bays? What about a remote and VFD or LCD display?

Opting for a micro-ATX board isn't really much of a sacrifice for a media centre box in terms of features, and it opens up a range of new cases from SilverStone, Accent and Cooler Master. As we said the size, quality, price, look and reputation of the Antec NSK2400/Fusion case at 140 x 445 x 414mm caught our eye. Take care: At this width it won't fit in some cabinets.

Power and glory

Beware of cases requiring custom power supplies – we speak from experience. Our Antec Overture II is a very sexy little HTPC case but, to cram in an ATX motherboard, Antec opted for a custom PSU – which is fine until you need to replace it. The Overture II has been discontinued, so when our power supply died late last year it took months to get another shipped from the US.

Learning from such tales of woe can save you a lot of pain on the road to home entertainment bliss, so we turned to the forums for advice and discovered plenty of like-minded travellers at xpmediacentre.com.au. We found them more than willing to share their expertise and experience to help in our quest.

Opting for the Antec NSK2400 case eliminated our need to choose a PSU and found the supplied unit to be acceptable for a quiet PC. Perfectionists might consider swapping it out for something like the highly respected Seasonic S12 430W PSU (\$129). Obviously a fanless PSU is tempting for a HTPC – such as those from Antec, Thermaltake and SilenX – but you'll run into major heat issues if you're using it in a small case. A good trick for reducing noise in the Antec NSK2400 is to unplug the central case fan (obviously keeping an eye on your CPU temperature).

Approaching RAM speed . . .

When choosing a CPU, the 2.13GHz E6420 (\$275) is the sweet spot and is not averse to a little overclocking. Keep it company with two 1GB sticks of Corsair Value Select DDR2 PC2-5200 (\$120). Remember this isn't a gaming rig, so don't pay for performance you don't need.

Now is also the time to give some thought to your operating system. If you're taking the leap into Vista, or you've succumbed to the lure of Linux, do your research to ensure all the necessary drivers are available.

All aboard the mobo

Choosing the NSK2400 case and E6420 processor obviously narrowed down our mobo choices, but regardless of whether you've gone ATX or micro-ATX, AMD or Intel, it's time to ask yourself the hard questions. What do you want and what do you need in a motherboard? PCIe, SATA, USB 2.0, Ethernet (perhaps gigabit) and high-definition audio are pretty much a given, but do you need FireWire and eSATA ports? Can you live with PCIe x1 slots, or do you demand x4 or even x16?

How about digital audio outputs on the motherboard? We say yes. Onboard video? We say no, but you'll probably end up with it anyway. RAID functionality? Again you'll probably get it but you don't need it. Chances are your case will only hold two drives, and you'll want to use that second drive for recording TV



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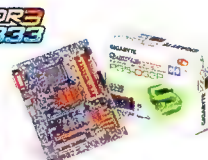
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The best home theatre PC is a compromise so decide what you're prepared to sacrifice.

on. Cramping in more drives increases heat and noise, you're better off using network storage instead.

Motherboard makers such as ASUS are targeting the HTPC market with feature-packed boards such as the micro-ATX P5V-VM SE DH (\$135), which features Wi-Fi and even a remote control that can power down the PC. Its ATX equivalent is the ASUS P5W-DH Deluxe (\$359). Be careful you're not paying extra to duplicate features. Look for a one that gives you a set to 'last state' power option so your PC automatically restarts after a blackout.

Admittedly ASUS' P5V-VM SE DH looks like the ultimate micro-ATX mobo for a lounge room companion, but it has one fatal flaw found on many of the micro-ATX boards we looked at – the two PCIe slots are next to each other.

To keep noise to a minimum we want a fanless GPU, which means a card with huge heatsink that covers the adjacent slot. Stick one in the PCIe x16 slot of the P5V-VM SE DH and suddenly you've lost the PCIe x1 slot, leaving you with just two PCI slots.

This wasn't a sacrifice we were prepared to make, so our Core 2 micro-ATX mobo short list grew much shorter – especially as we wanted a digital audio output. In the end we opted for ASUS' P5B-VM (\$159), where the second PCIe slot (PCIe x4 rather than x1) is the slot furthest from the PCIe x16 graphics card slot. Now a dual-

Passive cooling is your answer to limiting or removing excessive noise from your graphics card.

slot graphics card only cost us a PCI slot, saving our PCIe slot for a TV tuner card. The trade-off is that the board has a digital audio header but no jack on the rear IO panel. To use the digital audio out you need a bracket with the S/PDIF and coax jacks, sold separately (\$30), which fits in the spare card slot on the back of the case – our only spare slot! It was a sacrifice we made, knowing we could remove the jack from the bracket and run the digital audio cable through one of the air vents if we ever desperately needed that PCI slot.

The best home theatre PC is a compromise so decide what you're prepared to sacrifice and what you're not. Of course soon after our P5B-VM arrived, ASUS released the P5K-VM with a S/PDIF-out on the rear IO panel. Bugger.

Graphic content

Now we have the barebones of our sleek new home theatre PC, it's time to start filling the case with goodies. First stop – a CPU heatsink. As with the PSU, fanless CPU cooling would be fantastic for a HTPC from a noise perspective but a nightmare from a heat perspective. Even if you wanted to experiment with something like the popular fanless Scythe SCNJ-1000 Ninja heatsink, at 150mm tall it won't fit in many HTPC cases.

We've always been partial to the magic of Zalman, but you need to shop carefully to ensure everything fits nicely into the case. The horizontal CNPS7700 is too wide and the vertical 9500/9700 is too tall but the petite 7500 (\$59) is just right. The 8000 would also fit but has met with disappointing reviews. Sadly the new 8700, announced at CeBIT and featuring heat pipes, wasn't available when we started our build.



The combination of the Antec NSK2400 case and the Zalman CNPS7500 heatsink produced an impressively quiet case that could only be heard running when all else was still.

Next stop is the graphics card and here things get complicated again. The NVIDIA vs ATI debate rages as always, but we don't have a particular loyalty to either. Instead, we made a prioritised list of our requirements. Thankfully the Antec NSK2400/Fusion case doesn't require low-profile cards, but still take care that the heatsink doesn't extend too far above the card.

Top of the requirements list is PCIe, but no fan. Straight away you can take NVIDIA's 8800 series and ATI's Radeon 1950 range off the table unless you want to strip off the fan and experiment with aftermarket GPU coolers. Such cards would be overkill for a home theatre PC anyway as would be the new Radeon 2900 series (the Radeon 2600 wasn't available yet but certainly is worth considering).

This left us weighing up the new NVIDIA GeForce 8500/8600 cards against the old ATI Radeon 1600/1650s – the few fanless options featuring huge heatsinks that covered the adjacent slot. In a games-focused shootout the NVIDIA 8600 will take the honours, but remember grunt isn't everything in an HTPC.

Our next requirement really thinned out the competition – dual HDCP-compatible HDMI or DVI output/s. High-bandwidth Digital Content Protection is a form of DRM designed for high-definition video, encrypting the signal between the player and the display to stop naughty people copying it. If your player/GPU and your display aren't HDCP-compatible then you'll either be forced to watch your high-def movies in plain old standard-def, or they might not even play at all.

Naturally it didn't take long for naughty people to find away around HDCP so now, like most forms of DRM, it's just a major inconvenience for law-abiding citizens. Software like AnyDVD HD strips HDCP, but we'd still be wary of buying a graphics card or big display without HDCP compatibility just in case the copyright police pull something out of their hat and somehow the HDCP circumvention methods are circumvented. Sure, naughty people would come to the rescue and circumvent the circumvention of the initial circumvention, but why risk it?



To help high-definition look its best, we're after a card that can output a 1920 x 1080 pixel progressive scan image at 50Hz (frames per second), not just 60Hz. These are the frequencies of PAL and NTSC content respectively, corresponding with the frequency of the Australian/American AC power supplies. If the frequencies don't match, or your display is forced to convert the signal to a different frequency, it can result in a slight judder in the image. While you want 1920 x 1080 at 50Hz for watching high-definition Australian television or home-made HD movies, Blu-ray and HD-DVD are in 24Hz so if you have plans to upgrade to one of these drives then look for a card that can output 1920 x 1080 at 24Hz (or a multiple of) and a display that can handle it.

Speaking of the high-def war, while we think Blu-ray has the upper hand right now we wouldn't buy either drive in either format, considering prices will drop dramatically in the next few years. As such, we opted for a sturdy Pioneer DVR-212D SATA x18 DVD burner (\$58) to tide us over. We later discovered the DVR-212 is much noisier playing DVDs under Vista MCE than in any



Below: Third-party add-on displays can help bring older cases into the 21st century.



Below: HTPC cases look less like PCs with each generation. SilverStone's range will fit right into a home theatre rack.



Black or silver is the palette du jour of every living room. Don't even think about beige.

other application, or than in XP. We tried a few different applications to slow down the DVD drive – DVDIdle, Nero Speed Drive, AnyDVD HD and Pioneer's QuietDrive utility – but none helped. In contrast ASUS' DRW-1814BLT drive is whisper-quiet under MCE during both DVD and DivX playback. To be honest we'd rather a Pioneer drive, but we can't recommend the DVR-212 for a Vista MCE box until Pioneer update the firmware to make it compatible with QuietDrive.

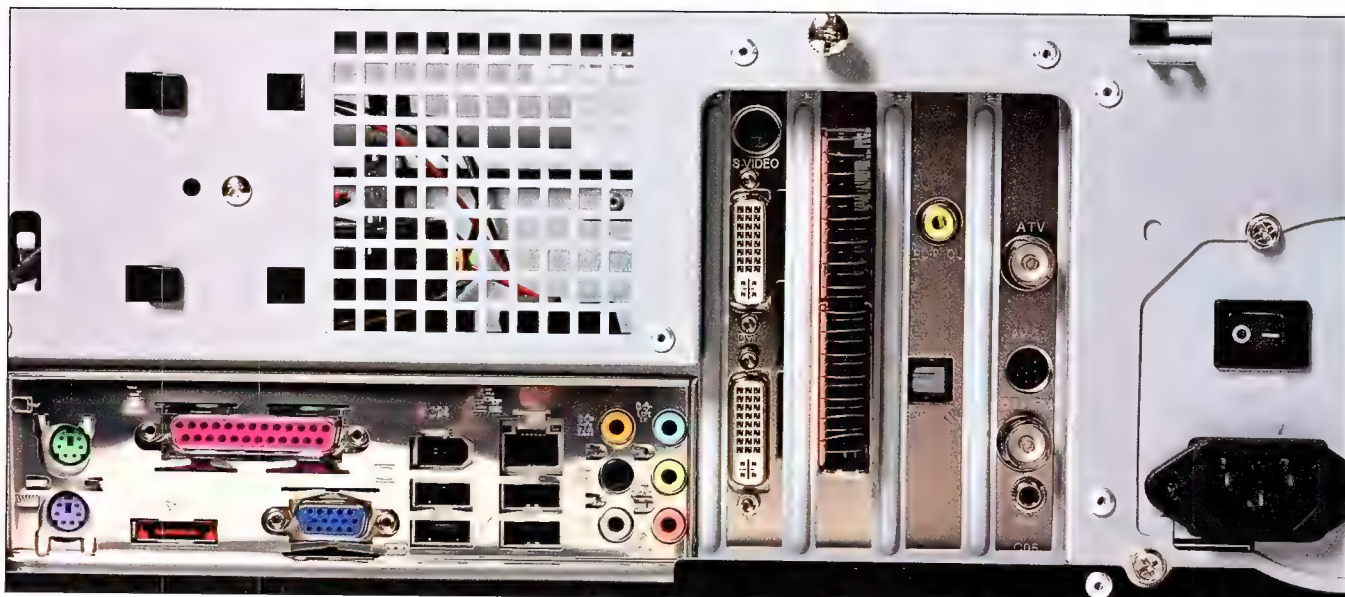
Don't spend too much money on a graphics card to support the high-definition TV you hope to buy in a few years time. It might be better to settle for a cheaper card now rather than an expensive one that will be superseded by the time your lounge room is blessed with a high-definition panel.

We narrowed our list down to GIGABYTE's GeForce 8600 GTS GV-NX86S256H 256MB (\$310) and HIS' Radeon X1650 Pro iSilence II 256MB (\$180) and decided to try both so we could assess both the NVIDIA and ATI drivers. If you're on a budget, consider GIGABYTE's GeForce 8500 GT (\$180).

Even though we want HDMI or DVI for connecting to a high-definition panel we're also after old-fashioned composite video 'TV out' because, we're ashamed to admit, we don't actually own a slice of high-definition goodness yet.

Thankfully Sony sent across a sexy 40-inch 1080p X Series Bravia LCD for putting our dream HTPC through its paces, and Epson supplied a 1080p TW-1000 3LCD projector.

Antec NSK2400 case rear – throw in the GPU, digital audio bracket and TV tuner and all the slots are taken.





Of drives and tuners


When you're building a lounge room friendly PC, quiet hard drives are essential. While people speak highly of Western Digital's SE16 we opted for a pair of 500GB Samsung SpinPoint T Series HD501LJ 7200 RPM 16MB cache SATA 3Gb/s drives (\$199 each). To save dollars you could go for an 80GB (\$60) and 250GB (\$90) drive combination, but we strongly recommend having two drives for the performance boost of recording TV to a separate drive.

Of course it wouldn't be much of a media centre without a TV tuner card to stick in that spare PCIe slot, as internal devices generally have stronger tuners in them than USB tuners. We consider dual-digital television tuners a must, so you can record two shows at once, and they should be high definition. A single aerial input for both DVB-T tuners is handy, as are analogue video inputs if you want to capture video from external sources such as a VCR. This could require separate software, because Microsoft's MCE will only recognise analogue or digital tuners – not both at the same time. Taking all this into consideration, we opted for a DNTV Live! Dual Hybrid PCI Express S2 (\$180).

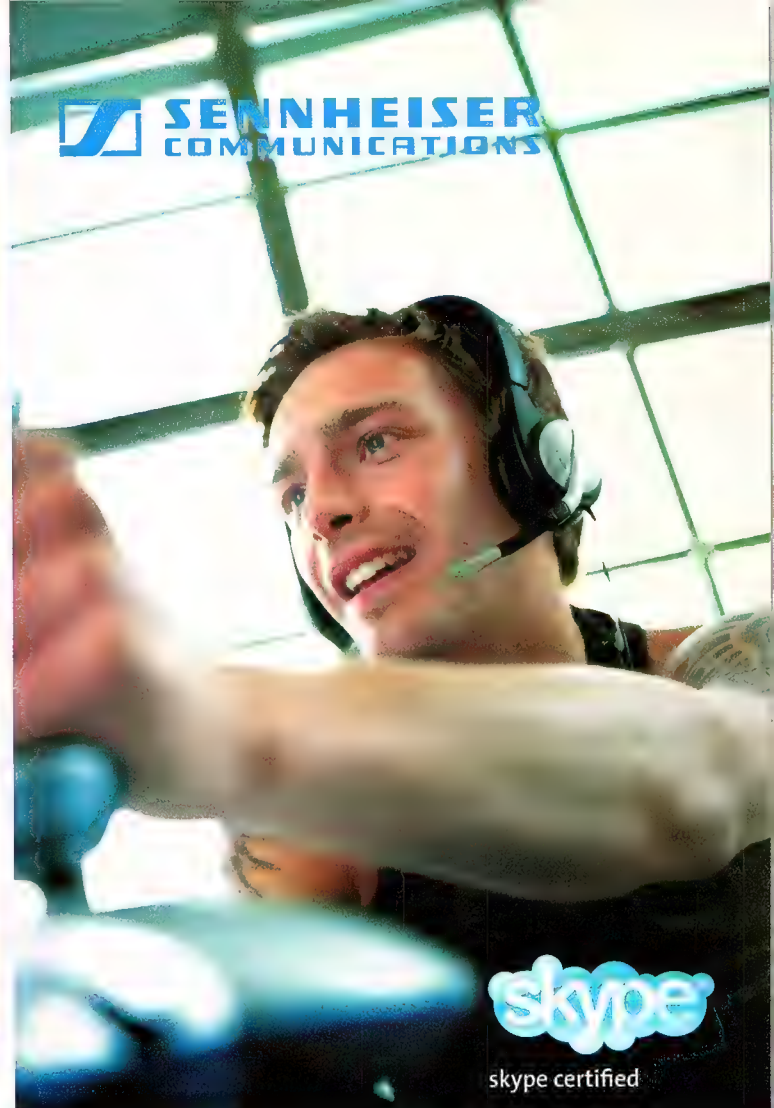
Don't worry too much about the included software if you intend to use a media centre interface like Microsoft's Media Centre Edition of XP or Vista. Nor should you worry about the remote control too much if one comes with your case or VFD/LCD readout.

End of the beginning

So there you have the spec sheet for a lean, mean home entertainment machine – all for less than \$1350 if you take the budget options. Thanks to Altech, Standard Computers, Rectron, GIGABYTE, AKA Technology, DigitalNow, SilverStone and Scorpion Technology for helping us pull all the parts together as well as Sony and Epson for the high-definition displays.

Building it is the easy part, next month we'll fire it up and come to grips with Vista's new Windows Media Center interface. 

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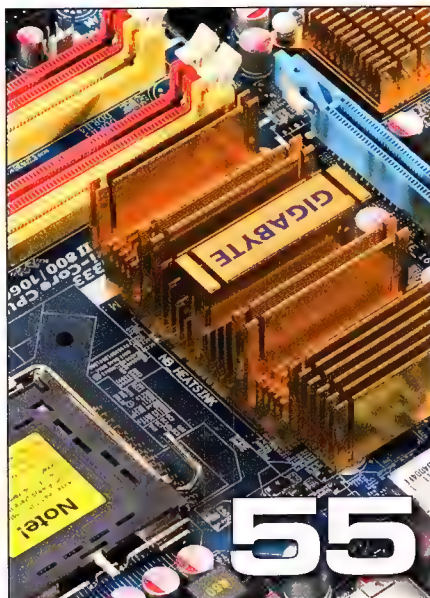
NEWS, REVIEWS AND ROUNDUPS ON THE LATEST HARDWARE

This month we witnessed some very impressive pieces of hardware. These ranged from Intel's new king of the hill, the Core 2 Extreme QX6850, to Kingston's ultra low-latency series of HiperX PC2-6400 rated at CAS 3.

Much to our enjoyment, both of these components were more than

happy to overclock. The Core 2 Extreme QX6850 in particular obtaining a maximum frequency of 4609MHz under dry ice cooling.

It wasn't all happy days in the overclocking sector, with the XPS 720, not surprisingly, offering no available options for the tweaker. Thankfully it somewhat covers this by being visually impressive and easy to work with.



HARDCORE CONTENTS

How we test 40
Detailing the regulars of the labs.

Head to head: 42
Game-to-movie adaptations
Did you cringe? Compare your thoughts with Christopher Taylor's.

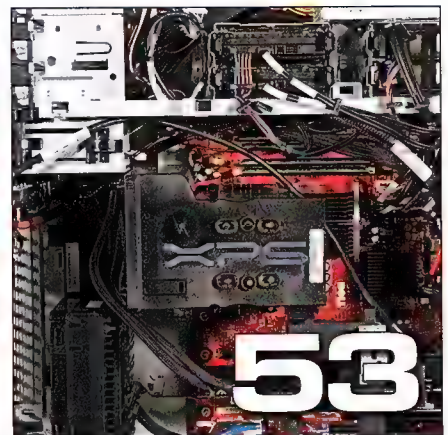
Gearbox 50
It's gear. It's in a box. It's gearbox!

Kitlog 58
The reason you're considering a third job.

Ground Zero 60
Dan tells them where to stick their omni-directional antennas.

Hardware Reviews:

Corsair XMS3 DDR3-1333 C9	52
Dell XPS 720	53
Intel Core 2 Extreme QX6850	54
GIGABYTE GA-P35-DS3R	55
TEAM Xtrem Dark PC2-6400 C4	56
Kingston HiperX PC2-6400 C3	56
Antec TruePower Quattro 850W	57
NETGEAR HDXB101	57



BENCHMARK

How we test,
what we test,
when we test it

3 DMark05 and 06 are the legs of our bench. As freely downloadable tools, they allow people all around the world to compete on a single platform, regardless of its indication of real world application, and its ability to keep our table stable.

On the gaming surface, Call of Duty 2 takes first honours in the FPS department. Quake 4 follows closely behind for our OpenGL benchmarks, taking over from where the venerable Doom 3 left off and offering multiple CPU optimisations. Half-Life 2 remains, its market penetration simply too huge to ignore. X3: Reunion makes an appearance, in an effort to have a benchmark that is not an FPS. In the same line, Splinter Cell: Chaos Theory has also been added. Other games do exist. Honest.

All tests are run at 1280 x 1024, 1600 x 1200 and 1920 x 1200 with vsync off, to cater for the most popular LCD resolution, CRT resolution and those who own widescreen monsters respectively.

To hit the CPU, we use LAME MT, a multithreaded version of the popular MP3 encoder, which is used to compress a standard 30-minute WAV file. Similarly, VirtualDubMod is used to compress a standard 1GB raw video file into XviD at 1300Kb/s. Other CPU specific tests in our stable are Maxon's CineBench and SuperPi Mod. Rounding out the suite, SiSoftware's Sandra tests several subsystems across the board, while HDTach and ATTO Disk Benchmark helpfully provide hard drive scores.

All these tests are run on a Windows XP SP2 platform, running the latest official drivers available. Every test is run three times to eliminate any oddities that may crop up along the way, the final result printed in the magazine being an average of those scores.

Of course, all this is pointless without a standard set of hardware, and as such it is laid out below for the world to see. On with the testing!



The Atomic Hot Award is given only to the best. In our roundups, we differentiate the best further using the following awards:

VALUE AWARD This means the product is the best buy price-wise.

PERFORMANCE AWARD Price isn't a big factor – it just has to make our benchmarks burn and our eyes water.

EXTREME AWARD Forget everything. If it's mind-blowingly amazing, then it'll get an Extreme Award.

BENCHMARKS

Graphics

3DMark05
Game tests only, 4xAA, 8xAF
www.futuremark.com

3DMark06
Game tests only, 4xAA, 8xAF (SM2.0), 8xAF (HDR/SM3.0)
www.futuremark.com

Half-Life 2
Canals custom timedemo, 4xAA, 8xAF, all details highest, HDR off
www.half-life2.com

Splinter Cell: Chaos Theory
Lighthouse Demo, Shader Model 3.0, 8xAF, shadow resolution high, all features on
www.splintercell3.com

X3 Rolling Demo
High settings, auto quality control disabled, glow enabled, 4xAA, 8xAF
www.egosoft.com/games/x3/info_en.php

Call of Duty 2
Hill 40 – Defend custom timedemo, 4xAA, 8xAF, all options highest
www.callofduty2.com

Quake 4
High quality, 4xAA, 8xAF, Multiple CPU support, all options highest
www.quake4game.com

Subsystems

HDTach
www.simplissoftware.com

LAME MT
softlab.technion.ac.il/project/LAME/html/lame.html

VirtualDubMod
virtualdubmod.sf.net

SuperPi Mod
www.xtremesystems.com/pi

Cinebench
www.cinebench.com

SiSoft Sandra
www.sisoftware.co.uk

Everest
www.lavalys.com

Others

DisplayMate
www.displaymate.com

ATI Tool www.techpowerup.com/attitool

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FRAPS
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Stress Prime 2004 Orthos
sp2004.fre3.com

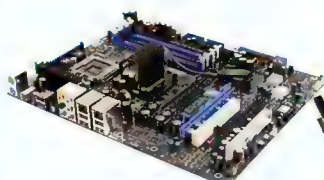
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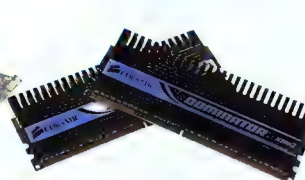
▲ Intel Core 2 Duo X6800

EVGA



▲ EVGA 680i SLI

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▲ 2GB Corsair Dominator PC2-10000

WD Western Digital



▲ WD 1500ADFD

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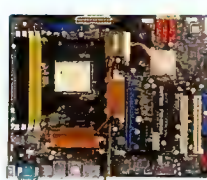
▲ Enermax Galaxy 1000W

AMD



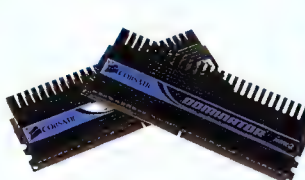
▲ AMD Athlon 64 FX-62

ASUS



▲ ASUS M2N32-SLI Deluxe

CORSAIR



▲ 2GB Corsair Dominator PC2-10000

DELL



▲ Dell 2405FPW

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▲ ASUS 8800 GTX



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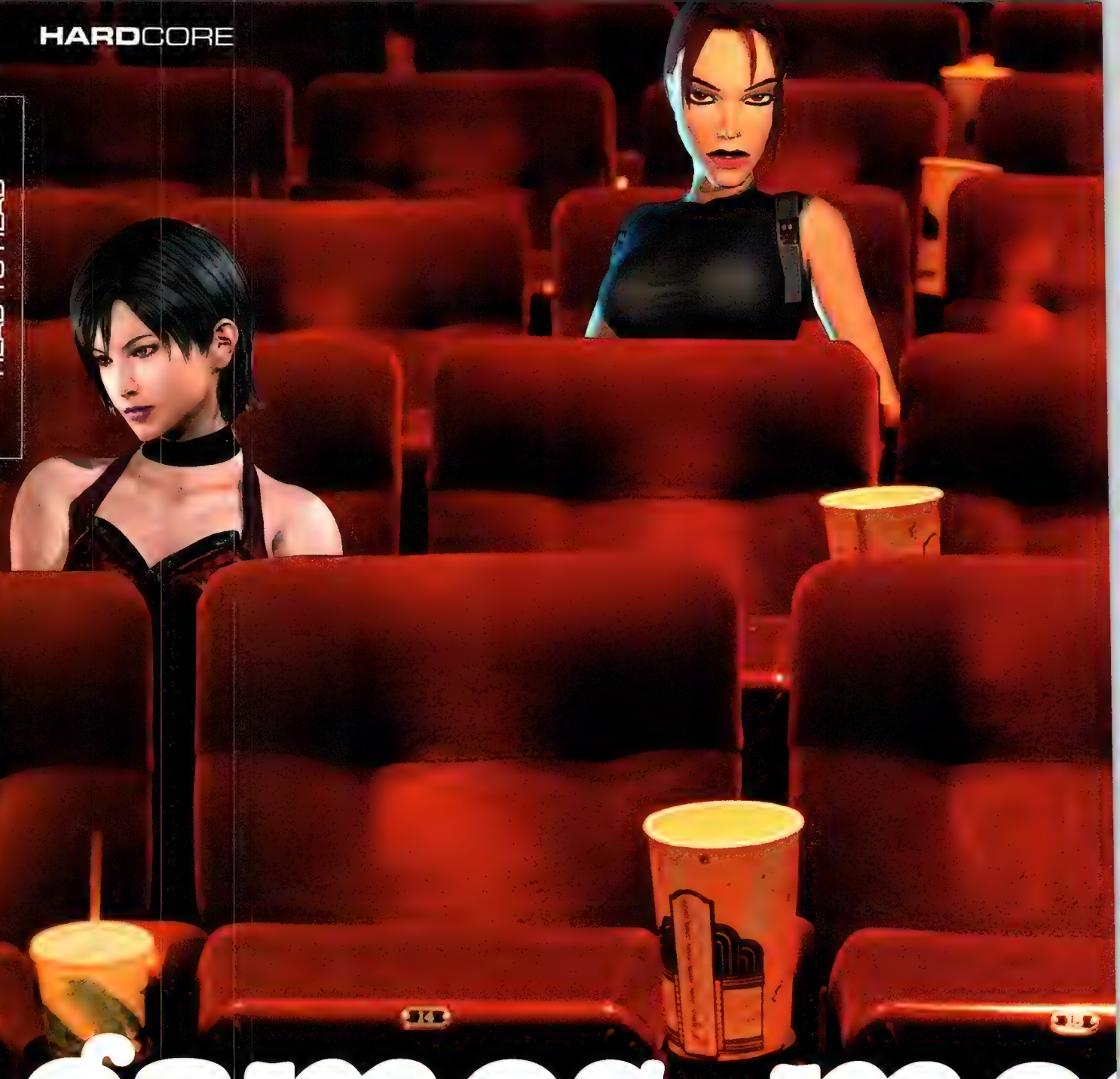
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games, me

Christopher Taylor, poor bastard that he is, finds himself strapped to a sofa and forced to endure a torturous marathon of game adaptations – from *Silent Hill* to *Street Fighter*. Will he find any that are actually good?

Since the dawn of time or, to be more accurate, 1993, there has been many a brave filmmaker who has signed up to do the seemingly impossible – to adapt a popular game into a movie that's actually good. Numerous directors, screenwriters and actors have made their name through their determination to succeed in this noble quest. For not letting past failures dissuade them.

Failure, you see, is common. The sad reality for these folks who valiantly try and bring much-loved games to the big screen is that the fruits of their labours rarely receive a warm reception from gamers – the very people, you'd imagine, they're intended to please. To add insult to injury, these movies typically don't get much love from critics either. And the less said about the general audience's reaction the better...

For the most part, the film-going public's hostility is justified. The vast majority of game adaptations have sucked. And we're not just talking the regular



et movies...

Pearl Harbour kind of sucked. We're talking the Razzie-nominated, IMDb-bottom-100, one-percent-freshness-rating-on-RottenTomatoes.com kind of sucked. Many of these movies have been utterly, undeniably and irreversibly crap – even when the screenwriter has a little rant about his intention with the film printed inside the DVD case, saying how the movie is really one giant nod to the B-grade flicks of the past.

Note our use of the words 'majority' and 'many'. The odd game adaptation could be considered mildly entertaining. Good, even, so long as you're prepared to watch it for what it is and not use *The Godfather* as a benchmark. Hell, you might even catch the occasional glimpse of filmmaking that, technically at least, is brilliant. This is something that'll really shock you if, like we did while researching this article, you've just sat through a movie marathon composed of *Alone in the Dark*, *Tekken*, *Double Dragon* and *House of the Dead 2*.

Yes, dear readers, we voluntarily endured such a torture. Not because we were feeling particularly masochistic this past month, but because we thought it'd be kind of neat and fun – although we changed our minds on this part after seeing the first film, *BloodRayne* – to do a round-up of game adaptations. To pit the painful against the enjoyable. To honour those that remained true to their gaming roots and to pan those that shat on them. To sort, we suppose, the wheat from the chaff.

And so, without further ado, here it is – our official verdict on movies based on games.

the good...

5. Doom

Year 2005 **Director** Andrzej Bartkowiak
Starring The Rock, Karl Urban, Rosamund Pike



Ah ... *Doom*. A movie that managed to simultaneously disrespect and pay homage to its source material. Whether it was for reasons of narrative or marketability, the omission of all references to Hell was a cause for outrage. This was the sole reason *Doom* managed to lose so many points in the 'Accuracy' category.

But it wasn't all so grim, otherwise *Doom* wouldn't have made it into our prestigious top five. The first-person sequence was a work of genius, even if it probably induced motion sickness in half the audience. So too was the naming of minor characters after id Software staff. And then there was that scene where The Rock acquired the series' signature weapon: The BFG9000.

Doom was an unashamed *Aliens* clone, but that didn't bother us so much. There are worse films director Andrzej Bartkowiak could've borrowed from. What did bother us – and what stopped *Doom* making it to spot three or four – was the decidedly anti-climatic ending, the terrible acting and yes, the serious lack of demons and Satanic decor. Sorry Mr Bartkowiak, but a Martian virus that turns people into monsters just ain't *Doom*. Even if those monsters look exactly like the Imps, Pinkies and zombies from the games.

QUALITY 5

ACCURACY 5



4. Silent Hill

Year 2006 **Director** Christophe Gans
Starring Radha Mitchell, Sean Bean, Alice Krige



Although the DVD packaging said something about *Silent Hill* having a two-hour runtime, it felt like it'd been a good decade since we'd first sat down by the time the end credits started to roll. But to be fair, *Silent Hill*, as much as it dragged, was a solid adaptation.

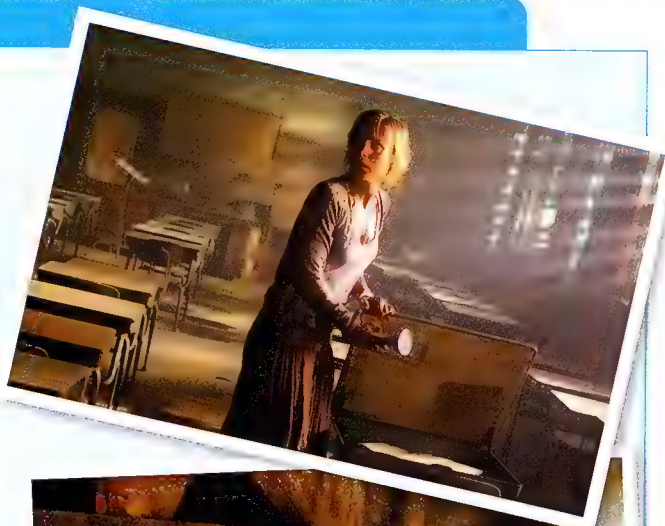
Director Christophe Gans – whose name you might know from that French mystery horror kung-fu hybrid, *Brotherhood of the Wolf* – successfully managed to make a film that was respectful of and faithful to its source material. Of course, in doing so he managed to damn near alienate anyone who wasn't a diehard *Silent Hill* fan, but hey...

Silent Hill was a rarity among game adaptations. First of all, it completely retained the storyline and general feel of the games it was based on. Second, the characters and their motivations were reasonably believable. And finally, in parts, it was absolutely beautiful. The monster and set design were amazing, and the camerawork was quite often breathtaking.

To be honest, your entertainment mileage may vary depending on how you much you like the games. Fans will like it and others will wonder what's so special. But while the visuals, sound effects and the acting aren't flawless, they all added up to an impressive, faithful game translation that was certainly a hell of a lot better than most of the films in this roundup.

QUALITY 6

ACCURACY 10



3. Final Fantasy: The Spirits Within

Year 2001 **Director** Hironobu Sakaguchi
Starring Ming-Na, Alec Baldwin, Ving Rhames



The first half-hour of *Final Fantasy: The Spirits Within* was dry, dull, boring, mind-numbing, soul-crushing stuff. No two ways about it. But once the whole thing finally got into gear, *Final Fantasy* proved to be a reasonably entertaining movie, even if the plot was largely flavourless, generic sci-fi fare.

The characters were well written, but forgive us if we failed to connect with the emotions they were trying to convey. The much-vaunted CGI was the source of our inability to empathise with the characters, where it turned

out to not look as good in motion as it did in the stills.

The real standout feature of *Final Fantasy* turned out to be Elliot Goldenthal's score, although fans of the games might disagree. But that goes for the movie as a whole. According to them, *Final Fantasy* bore little resemblance to its source material and for that it was on the receiving end of a great deal of criticism. Conversely, we thought that director Hironobu Sakaguchi included more than enough parallels with, and nods to, the series.

Sadly, *Final Fantasy* was a box office disaster – it killed Square Pictures – but the reviews were mixed when they really shouldn't have been. *Final Fantasy* wasn't an Oscar-worthy film and it suffered from many a flaw, but it certainly deserved a lot more credit. If you're yet to see it, head down to your local video shop. You won't be disappointed, unless you happen to be a hardcore *Final Fantasy* fan.

QUALITY 7

ACCURACY 5



2. Lara Croft: Tomb Raider

Year 2001 **Director** Simon West
Starring Angelina Jolie; Daniel Craig; Jon Voight



We're not sure why we liked *Lara Croft: Tomb Raider*. It was silly and included a number of elements that'd otherwise drive us nuts, like unnecessary fan service, a bumbling nerd sidekick, and far too much nonsense about secret societies. But for some reason, we really, really enjoyed it.

Tomb Raider was faithful to its roots, but not to the point that it alienated non-gamers. Indeed, it's still the most financially successful game adaptation ever. We loved the way director Simon West managed to give the film a real 'gamey' feel, particularly in the Cambodian tomb battle and Croft Manor shootout.

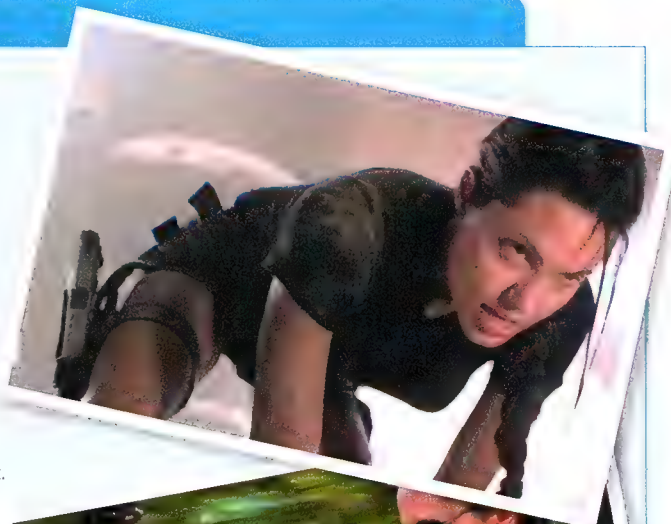
And then there was Angelina Jolie. She was great. Sassy and sexy, graceful and brash at the same time – everything that Lara Croft needed to be. And sure, the shower scenes that West slipped in were pretty blatant examples of fan service, but we think we can forgive him.

Tomb Raider was a visual delight, and we're not just talking about the bathing scenes. The golems in the Cambodian tomb looked very cool, even if they weren't the most original of movie monsters. The sets were pretty flash too.

On the whole, *Tomb Raider* was everything that it should've and could've been – a mindless action flick helmed by a smart-mouthed, busty arse-kicker. Damn shame about *The Cradle of Life*.

QUALITY 7

ACCURACY 5



1. Resident Evil

Year 2002 **Director** Paul Anderson
Starring Milla Jovovich; Michelle Rodriguez



Hardcore fans of the games might've hated Paul Anderson's movie, but we're rather fond of it. The opening scene, in which the T-Virus is unleashed on a group of unfortunate scientists, really served to set the tone of what was to follow – a darkly entertaining, intense and, for the first half at least, mysterious sci-fi horror affair.

Our only real beef with *Resident Evil* wasn't director Paul Anderson's decision to change the setting from, say, the zombie-infested mansion of the original game to an underground lab. No, it was the way some of the characters were so clearly red shirts (that is, destined to die) from the outset that annoyed us. It was too easy to predict who'd be knocked off and who'd still be kicking by the time the credits rolled.

Fans, though, weren't happy about his choice of setting and because of this it's hard to score this movie in terms of accuracy. We reckon that Anderson nailed the feel and that the choice of setting was valid given the nature of the story he wanted to tell, and that makes this a fairly accurate interpretation of the game in spirit. No matter your views on the mansion/laboratory situation, though, you can't possibly deny that those zombies and the Licker were great.

Shame Alexander Witt managed to trash Anderson's good work with the 2004 sequel, *Resident Evil: Apocalypse*.

QUALITY 7.5

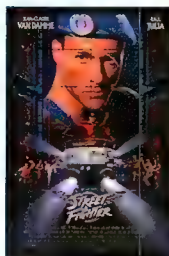
ACCURACY 7



the bad and the ugly...

5. Street Fighter

Year 1994 **Director** Steven E. de Souza
Starring Jean-Claude Van Damme; Kylie Minogue



When we first saw it all those years ago, *Street Fighter* was a bafflingly bad film. After all these years, we anticipated we'd feel some kind of slight fondness for it, but we were devoid of any sliver of attachment. We know that it wasn't supposed to be serious, so we won't pan it as if auteur Steven E. de Souza was trying to tell a heart-rendering, tale of martial arts and world domination, but still...

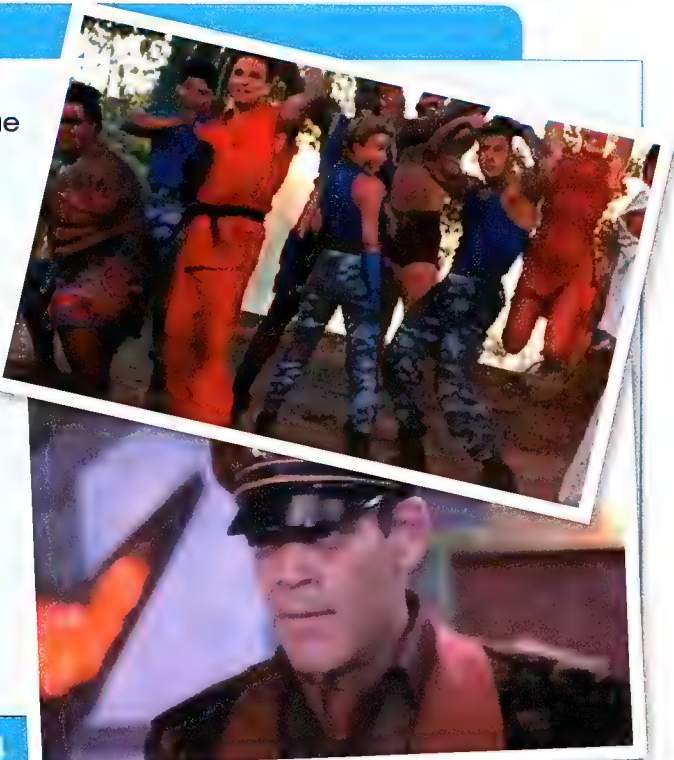
One of its many flaws was that de Souza simply used too many characters. Sure, some were just in the background, but he should've chosen two or three and stuck with them. That worked for *Mortal Kombat* – by far the best of the fighting game movies that assaulted film-goers during the 90s.

The performances were, without exception, appalling. Van Damme has done some terrible films, but we'd have to say this one takes the cake. And Ms Minogue... dear God, we're ashamed to share a country with you.

Dumb movies can be loveable – just look at *Tomb Raider* – but *Street Fighter* wasn't. Kind of like Uwe Boll's films which, unfortunately for you, are coming up next.

QUALITY 2.5

ACCURACY 4



4. BloodRayne

Year 2006 **Director** Uwe Boll
Starring Kristinna Loken; Ben Kingsley



The game, if you recall, had Nazis. Nazis being the natural enemy of scantily-clad, sword-wielding, half-vampire bad asses, and the standard enemy of choice for any action game ever made. Stands to reason, then, that the movie would have Nazis too. Lots and lots of Nazis ripe for the slashing, stabbing and sucking. There's no reason for not including Nazis in the movie – the fact that the movie was set in 18th-century Romania shouldn't have anything to

do with zero Nazi content.

Much like *Street Fighter*, *BloodRayne* has this... magnetic quality. It's simply amazing, to think that a movie could be this bad. It was painful watching Madsen and Kingsley debase themselves under the direction of Dr Boll. Not so much Loken, however, who's not once been in a good film. Speaking of Loken, the worst part of the film was her sex scene.

This was a special moment in a special film, where she thrusts a fellow vampire hunter against a gate, uncovers her breasts and begins to hump him like some sort of machine you'd find on a construction site. The gate rattled, her boobs bounced, her consort's tongue played across her nipples and then you, the viewer, reached for the bottle of scotch to make it all go away.

If only there were Nazis.

QUALITY 1.5

ACCURACY 3



3. House of the Dead

Year 2003 **Director** Uwe Boll
Starring Tyron Leitso; Clint Howard; Ona Grauer



As the title implies, *House of the Dead* should have something to do with a house. A house filled with dead things. Zombies and so forth. Surely you've played the arcade game. Uwe Boll certainly had – images from the game served as a way of telling us that a particular sequence had just come to an end – but felt that the house was unnecessary.

That's right, there was no house in a movie that was specifically about house.

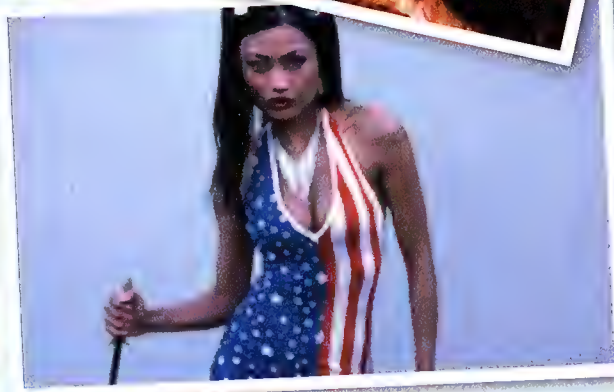
Okay, we tell a lie, there was a house. A little one the characters briefly take shelter in. The rest of the time, they were running around an island punching, kicking, pistol-whipping, shotgunning, machinegunning and detonating zombie after zombie.

There was a scene in the middle of the film when the characters had to make their way across a clearing to the house. For fifteen minutes we watched them blast away and beat up dozens, maybe hundreds of zombies. It just went on and on. Boll even dredged up the two most abused film techniques of recent years – bullet-time and the 360-degree pan. Again with the scotch...

We'd like to tell you that *House of the Dead* was so bad that it was actually entertaining, as screenwriter Mark A. Altman claimed it was intended to be... but that'd be a bald-faced lie.

QUALITY 1

ACCURACY 2



2. Double Dragon

Year 1994 **Director** James Yukich
Starring Robert Patrick; Alyssa Milano

Double Dragon was hilarious, even – and maybe especially – when it wasn't trying to be. Perhaps the worst – and funniest – part was when the brothers found themselves speeding away from gangsters in their mum's station wagon, which happened to be fitted with a jet engine. Just like the engine on a steam train, this rather bizarre contraption required fuel to be fed into an open furnace – located right where the gear stick should be. And so the boys, aided by mum, proceed to throw in discarded fast food wrappers and chip packets, schoolbooks and cans of cheese whip.

At the time of writing this article, a quick search online told us that the DVD was available for \$9.95 at a number of retailers. If you're yet to see it, we recommend you track down a copy. It'll be the funniest movie you'll see all year, guaranteed.

QUALITY 0.5

ACCURACY 0.5



1. Alone in the Dark

Year 2005 **Director** Uwe Boll
Starring Christian Slater; Tara Reid; Stephen Dorff

Double Dragon's terribleness made it endearing. Not so with *Alone in the Dark*. It's depressing to the point where it should be sold only after a legal waiver is signed, ensuring that Uwe Boll won't be held liable if any viewers commit suicide.

We vaguely recall Carnby of the games being a figure who'd wander into monster-infested mansions on his lonesome, armed with not much at all. The Carnby of the film, though, never went anywhere without back-up in the form of a squad of heavily-armed troops from some government agency.

The story putted along at an excruciating pace and Slater, Reid and Dorff all managed to deliver spectacularly shit performances. If you're yet to do so, don't waste your time or money watching this. It's bloody cancerous.

QUALITY 0.5

ACCURACY 0



A new hope


If you're wondering why certain films – say, *Mario Bros*, *Tomb Raider: The Cradle of Life* and *Resident Evil: Apocalypse* – aren't in that final list, believe us, they didn't miss the cut by much. You'd be amazed at how difficult it was to come up with a bottom five.

We hope that one day there will be a film that'll manage to please everyone – gamers, critics and regular folk alike. *Halo* certainly had potential until it became the cinematic equivalent of vapourware. *Max Payne*, too, could be good given that Max, as cliché a fellow as he may be, is one of gaming's most rounded and developed characters.

But realistically, we can't see it happening.

The rights to a number of popular games have been optioned, games that could make for great movies if handled correctly. Think *God of War*, *Kane & Lynch*, *Mech Warrior*, *Metal Gear Solid*, *Alice*, *Splinter Cell*, *Warcraft* and *Gears of War* – which we envision as a sort of futuristic *300*, all bullets-and-brawn. On a slightly more inane note, the rights to *The Sims* were recently sold.

In the near future, though, you can look forward to *Hitman*. There's a trailer kicking around online. Timothy Olyphant – whom we loved in *Deadwood* – is set to play 47. Fans of the game are saying that maybe Jason Statham would've been a better choice. We disagree. Seriously folks, there's more to 47 than hairlessness. He has style, class and a certain air of arrogance about him. As much as we love Statham in *Lock*, *Stock* and *Snatch*, he's no 47.

Here's hoping that *Hitman* is the game adaptation we've been waiting for and that Olyphant proves his critics wrong. 

THE NOT-SO-GOOD DOCTOR

We hadn't seen any of Dr Uwe Boll's movies before we did this article. Like many who'd yet to experience that displeasure, we went in thinking that they'd not be as bad as we heard. They were. *Resident Evil* is nothing but dumb fun, but fun nonetheless.

Boll's films aren't fun.

He isn't content with the criticism of gamers and critics. Later this year, he'll be releasing *Postal*, of which the first four minutes have been leaked online. It shows two hijackers sitting in the cockpit of an airliner, debating the amount of virgins they'll be receiving in Paradise. Unable to reach a conclusion, they put in a call to their boss, Osama bin Laden.

He provides them with an altogether different figure to what they'd been told originally and so, unsatisfied, they hang up on him and decide they'll quit their terrorising and fly everyone to the Bahamas. At this point, several passengers break into the cockpit and attempt to retake the plane.

We cut to a window washer, viewed from inside one of the World Trade Center towers. The airliner appears in the background of the shot, growing larger and larger before exploding against the screen.

But what really sums up Boll's abilities as a filmmaker is that *House of the Dead 2*, the straight-to-DVD turd directed by the original's screenwriter, is superior in every way to its predecessor. Even with its gratuitous naked sorority girl zombie scene.

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www.au.creative.com

CREATIVE

ROCK 8" LCD Photo Frame

Price \$TBA Supplier Anyware Website www.anyware.com

Supporting up to a resolution of 720 x 480, this small LCD photo frame can not only display JPEG images, it can also play back MP3, WMA, AVI and MPEG-4 formats. Sporting built-in speakers, a SD/MMC/MS card reader and supporting input for USB flash drives, the memory of loved ones and times gone by are no longer a quiet and still experience.

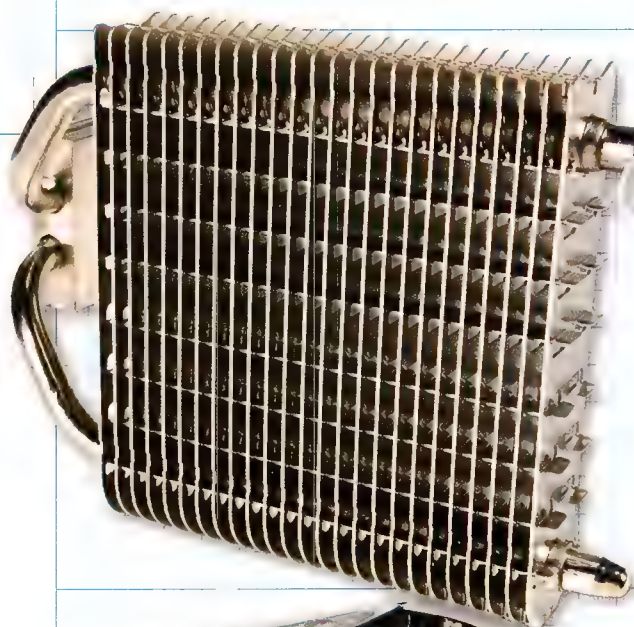


Thermalright HR-05-SLI Chipset Cooler

Price \$30 Supplier PC Case Gear Website www.pccasegear.com

Do you need more effective chipset cooling but you've spent too much on your SLI lovin'? Fear not! For the HR-05-SLI has come to your rescue. Designed specifically for those with dual-graphics cards and yearning for better chipset cooling, this heatsink allows for the cooling fin array to be pushed to the side, and therefore clearing the vertical obstruction of a graphics card.

Well-designed and of the expected Thermalright quality, this cooler would be right at home in a performance enthusiast's system.



Bluegears B-Ice Chrome 120mm LED Fan

Price \$30 Supplier PC Case Gear Website www.pccasegear.com

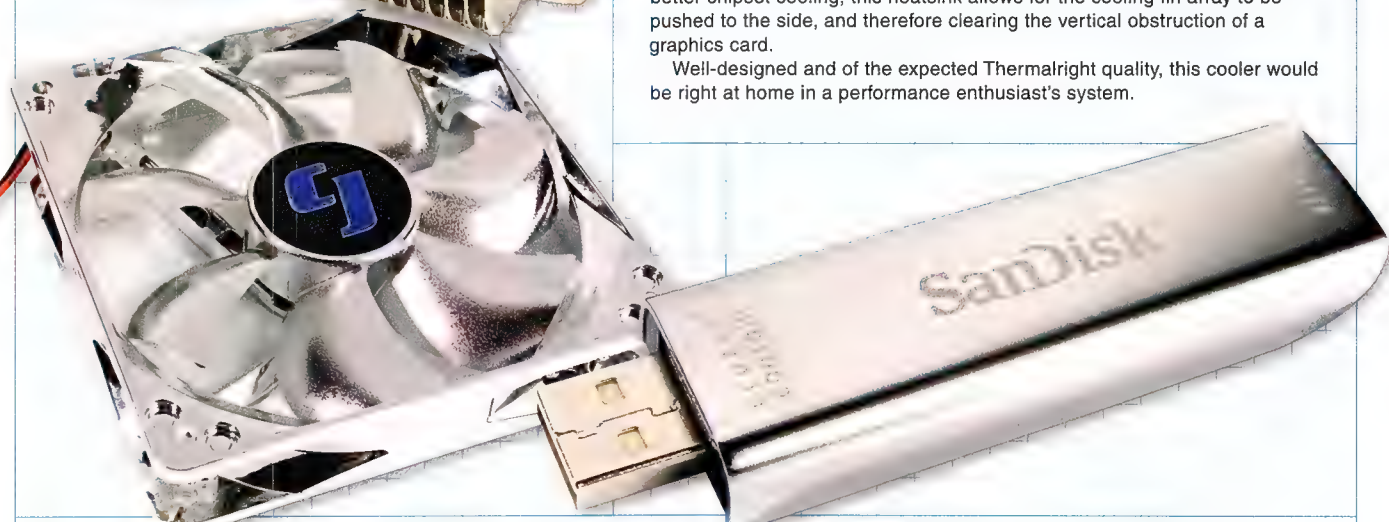
With a reflective chrome finish, four bright blue LEDs and at 120mm in size, this fan is set with enough impact to dwarf a late entrance by Run DMC. Spinning at 1800rpm, rated at 24.6dBA and pushing 63cfm of air, the B-Ice does make a bit of noise, though not equivalent to that of a screaming banshee. The chrome-finished surface reflects the bright blue LEDs in a way that distinctly separates itself from the average LED fan. If you feel the need to bling-out your system, this could be a good starting point.

SanDisk Cruzer Contour

Price \$159 Supplier San Disk Website www.sandisk.com

Featuring 8GB of portable flash memory, the Cruzer Contour gives the warm fuzzy feeling of 18MB/s write and 25MB/s read performance. SanDisk rounds out the package with a stylish aesthetic appearance – and it's a transformer to boot!

That's right; this little gadget has one very groovy sliding mechanism that reveals the USB connection in a way that made us wonder whether it was Frenzy in disguise. Topped out with ReadyBoost functionality and a lifetime warranty, this flash stick has the goods.



Olin 1GB Flash Drive

Price \$TBA Supplier Anyware Website www.anyware.com

With many individuals prone to misplacing their portable flash drives, which just so happen to be constantly decreasing in size, many companies now offer a lanyard with their tiny-sized products.

Continuing the trend, Olin offer a nifty metal-link chain. It secures to the USB flash drive, which can then be hung around the neck of the user when not in use.

Encased in aluminium and having a tiny footprint of 53 x 13 x 5mm, the Olin 1GB drive is a small and stylish offering to the USB flash market.



V-Gear TalkCam RX7

Price \$TBA Supplier Anyware Website www.anyware.com

You're sitting there, in your comfortable full leather, high-back office chair, watching your favourite adult webcast when, between the rather private thoughts you're having, the geek side of your mind creeps out – 'I wonder what web cam they use for this?'

Well, it's by all means possible that they're using the V-Gear TalkCam RX7... it's also possible that they're not, but that doesn't matter.

Sporting a built-in mic, on-the-fly video effects, media broadcast capability and other features, this could be the centre of your own PC studio.



LED Rocker Switches

Price \$4.50 each Supplier PC Case Gear Website www.pccasegear.com

Cheap, yet effective, these switches offer a solid and comfortable change between the off and on positions. With an LED inserted into the face of the switch, there is no guess work as to when the switch is completing the circuit and effectively offering an 'on' position.

These switches would be worth considering when planning that next Hotbox-winning case mod. With the potential to be wired up for controlling the on/off functions of fans, lights and all other weird and wonderful concepts, your imagination really is the limit.



Thermalright HR-07 Memory Module Cooler

Price \$25 Supplier PC Case Gear Website www.pccasegear.com

Perfect for cooling down some high-voltage, highly overclocked memory modules, the HR-07 has become the standard cooler for high-end overclocking kits such as the TEAM Xtrem PC2-9600 C5 kit (see page 56).

A part of the High-Riser series from Thermalright, the HR-07's heatpipe-attached cooling fin array stands well clear of the average height of a DIMM. Be mindful of the distance between the socket area and the DIMM slots when considering using these coolers in conjunction with a third-party CPU heatsink.



Corsair TWIN3X2048-1333C9DHX G

Josh Collins pushes his sticks to the limit.

SPECS

Price **\$TBA** Street Price **\$735**
 Supplier **Corsair Memory**
 Website **www.corsairmemory.com**
 Specifications **DDR3-1333; PC3-10664; 9-9-9-24 2T; 1.5V; 2x 1GB kit; non-ECC; life-time warranty.**

It seems like only yesterday we were clamouring for DDR2, despite early benchmarks showing their performance to be less than amazing over DDR. But, as technology marched ever onwards, DDR was superseded by DDR2. DDR3, only now making its way into our hot little hands, will likewise toss DDR2 on to the street where it will beg for a place in anyone's slot.

This month we welcome Corsair's entry in the growing DDR3 memory market – two 1GB modules in a paired kit, specced for 1333MHz frequencies with 9-9-9-24 timings on a 2T command rate. The sticks are rated for a mere 1.5V, the stock voltage for DDR3, and one of the strengths of the new standard.

To bench these new sticks, we pulled out GIGABYTE's GA-P35T-DQ6, as our regular test motherboard is based around DDR2 memory. The DQ6 also happens to be the same board we used to test Kingston's HyperX DDR3-1375 C7 kit last month. To simulate the 1333MHz frequency of the

suite with wPrime, the system completed the 32M test in 29.312s.

These results are slower than the scores obtained with the Kingston HyperX DDR3-1375 C7 kit, as was to be expected thanks to the lower timings and slightly higher frequencies of the Kingston kit. It should be noted however that the lower timings showed better scores in areas such as memory read and write and a sizeable decrease in latency response results, with Super Pi seeing a slight impact and wPrime still being

“The extra 267MHz made a massive difference, but further overclocking yielded instability and not a great deal of extra performance for the resulting flakiness.”

RAM, we grabbed our Intel X6800 and lowered the multiplier from 11 to nine and wound the FSB up to 333MHz, bringing the effective speed of the processor to 3GHz (effectively simulating an E6850). Next, we manually set the CAS, tRCD, tRP and tRAS latencies to 9-9-9-24 with a command rate of 2T, the CPU to memory divider to 1:2, and the memory voltage to 1.5V.

With the system jury-rigged for DDR3, we booted up to start our benchmarks. Everest read, write and latency tests scored 7575MB/s, 6058MB/s and 67.8ns respectively. Super Pi Mod 1.5, calculating pi to four-million places (SPi 4M), managed 1min 37.719s. Rounding off the test

primarily influenced by the CPU while running the 32M test.

The next step was to overclock the modules and see what true performance they held. The FSB was raised from the previously set 333MHz to 400MHz, the processor multiplier lowered to seven, and the memory divider left at a 1:2 ratio. While this lowered the CPU speed to 2.8GHz, it pushed the RAM frequency to 1600MHz. The sticks were more than happy to run at the higher speed on their default timings.

The DDR3-1600 frequency is a milestone within the DDR3 ranks and, while in the coming months we will see sticks released at these

Corsair's new 1333MHz DD3 sticks overclock nicely to 1600MHz, but don't bother pushing them further.

frequencies and boasting tighter latencies, for an entry-level piece of kit to hit this speed currently is an achievement to be noted.

At 1600MHz, the modules obtained 9201MB/s, 7202MB/s and 58.6ns in the Everest read, write and latency benchmarks. In Super Pi 4M they scored a time of 1min 39.812s and 31.281s in the wPrime 32M benchmark.

As you can see, the extra 267MHz made a massive difference. Further overclocking yielded instability at 1650MHz and not a great deal of extra performance for the resulting flakiness.

With the recent news that the Kingston HyperX PC3-11000 C7 kit has an RRP of \$1395, compared to the \$735 of Corsair's here, make it extremely attractive, even with CAS 9-based timings.

At stock, the modules don't particularly shine next to the HyperX hardware, but when overclocked, the increased bandwidth negates the impact of the higher latencies.

SCORE
8.0
 OUT OF 10

Dell XPS 720

Dell's pre-packaged beast box goes into the ring with Josh Collins.

Price \$3499 Street Price \$3499
Supplier Dell
Website www.dell.com.au
Specifications Core 2 Quad Q6600;
4x 1GB Crucial DDR2-667 C5;
8800 GTX; 2x WD 160GB Raptor
(RAID 0); SATA DVD-RW; Dell 680i-
based mobo; X-Fi Extreme Music;
Vista Home Premium 32-bit; NBD
onsite replacement.

The XPS 720 looks like it fell off the back of Doc Brown's time-travelling, fusion-powered DeLorian DMC-12. Of course, no DeLorian, sci-fi or conventional, was built with a quad-core processor or USB ports.

Lending strength to its sexy first impression is the front and rear-mounted LEDs. With two sets of tiered lighting on the front fascia and a single set of LEDs over the rear IO ports, the lights not only add character to the system, they're very useful when it comes to plugging in connections at the back of the unit. These LEDs can be programmed from within Windows to change colour, strobe, and more. This definitively adds to the 'bling' factor.

Packed with a Core 2 Quad Q6600, 4GB of DDR2 memory and an NVIDIA 8800 GTX, one would expect this system to be a beast in the performance stakes. With styling reminiscent of an 80's sports car, you can't help but think of the performance as being reminiscent of an 80's computer.

The 3DMark06 score reached 11049 marks. This may not seem bad – the 8800 GTX pulls the system over the line in the graphically-intensive tests and the Q6600 covers the CPU tests with its almighty four cores. Once the memory is isolated from these components, however, the system performs much like an E6600 dual-core in single-threaded applications. Horrifying stuff.

In the Super Pi 4M calculation the XPS 720

returns an utterly humiliating and shameful score of 2min 6.890s. This is a solid thirty seconds slower than an equivalent system built by the average enthusiast. The reason for this massive performance gap is down to the configuration and specifications of the RAM.

To get the ball rolling down a steep hill of 'OMG, why?' the 4GB of memory is supplied in the form of four individual modules. Any enthusiast is aware of the downfalls from such a configuration. These include, and are not limited to: increased strain on the chipset; the potential to lose tight timings; potential to lose the ability to run high frequencies; loss of overclocking headroom; and poor memory access. And just as the doctor of bad performance would suggest, the Dell XPS 720 is hit by many of these configuration issues.

Unfortunately, the bad news doesn't stop here. With the system packed with 4GB of memory, but only running a 32-bit version of Vista Home Premium, the 4GB, by default, cannot be accessed by the operating system. Therefore Windows shows 3GB due to the memory address space taken by other components such as the 768MB on the 8800 GTX. There is a workaround for this issue, though Dell did not appear to have implemented it.

In addition, not only is the memory limited to a lowly DDR2-667 frequency, it runs on extremely slack timings of 5-5-5-15 2T. No worries, we thought, we'll just jump into the BIOS and pull the pants up on the slackers.

We almost died inside when we found the BIOS utterly empty. Feeling as if we'd just walked into an abandoned Wild West town, complete with tumbleweeds, we poked our head around the place to see whether anything could be salvaged.

Much to our dismay, there was still nothing. We couldn't change the CPU multiplier or FSB, let alone touch the voltages. Not just the CPU, though – the voltages of *anything*. Not a memory divider or latency setting in sight. The BIOS was, without a doubt, the most barren BIOS we have ever ventured into, especially for a system marketed at the enthusiast.

Replacing the motherboard



The XPS 720 has the façade of a beast, but makes too many poor design decisions.

with something more potent will also prove a pain, thanks to the BTX form factor.

Adding to the feeling that the design wasn't thoroughly thought out was the fact that the two 160GB Western Digital Raptors were set in a striped RAID array using the motherboard chipset's in-built support. This configuration creates great concerns for the safety and security of any of the data stored on these drives. An additional storage and backup drive would have complemented the Raptors nicely.

It's not all doom and gloom though. What Dell manages to do well, it does very well. The internal case structure, as well as the hardware placement and wire management, is superb. Everything is precisely secured to present an overall tidy and visually impressive system, both on the inside and outside.

The system does have some strong points, but as an enthusiast gaming system, it simply falls short of expectations.



Intel Core 2 Extreme QX6850

Josh Collins enjoys the show as Intel's latest processor performs to impress.

Price N/A Street Price \$1,478

Supplier Intel

Website www.intel.com

Specifications Quad-core; 3GHz (333MHz x 9); 333MHz FSB (1333MHz quad-pumped); 8MB L2 cache; G0 stepping.

Still based on the Kentsfield core, this recently released quad-core from Intel is one of the new 1333FSB series processors.

While specced similarly to the currently available QX6700 and QX6800, which also feature 8MB L2 cache, the QX6850 comes with an increased the front side bus (FSB) speed. Boosted above the previous 266MHz rating to 333MHz – a 67MHz jump – the increase brings the effective FSB to 1333MHz, as it is quad-pumped.

Designed to operate in conjunction with the new Bearlake chipset, the QX6850, in all honesty, is simply a QX6800 with an ever-so-slight frequency increase. With a lower multiplier and higher stock FSB, the average consumer could overclock a Q6600, which happens to have the same stock multiplier of nine, to a 333MHz FSB and effectively have a \$370 processor performing at the rate of a QX6850. This is a well-known fact within the Core micro-architecture hierarchy, be it quad-core, dual-core or single-core. It's also why many are left bewildered as to why the Core 2 Extreme series demands such a premium price.

The reason behind the price inflation, other than the fact that the processor is the highest clocked model at stock, is the silicon wafer and core used for these processors. The unlocked multiplier, as is standard on the Core 2 Extreme series, is a huge draw card for overclockers. Add to this the fact that the binning process starts with the Core 2 Extreme range cores being chosen from the wafer first, it is expected that the chip is of the best quality. This leads to processors that are capable of high frequencies, behave better under stressful thermal conditions, and in a simple terms, are the



cream of the crop.

The QX6850, performance-wise, isn't anything that enthusiasts haven't already experienced with overclocked Core 2 Duos and Core 2 Quads. As such, we chose to focus on the overclocking potential for the QX6850, particularly due to it being of the newer G0 stepping. Pairing the QX6850 with the ASUS P5K Premium, 2GB Corsair Dominator PC2-1000 and a Thermalright Ultra 120 Extreme using a Noctua NF-S12-1200

fan, we set on our merry way to overclock this new king of the hill.

Not knowing what to expect, we set the CPU voltage to 1.35V and started ramping up the FSB until we found the maximum stable frequency. This ended up being 3.6GHz – per four cores. Say it with me people: three-point-six gigahertz with one-point-three-five volts.

Now having an idea of what we were in for we began the process of scaling the voltage and FSB, along the way

finding the maximum frequency for a set voltage setting.

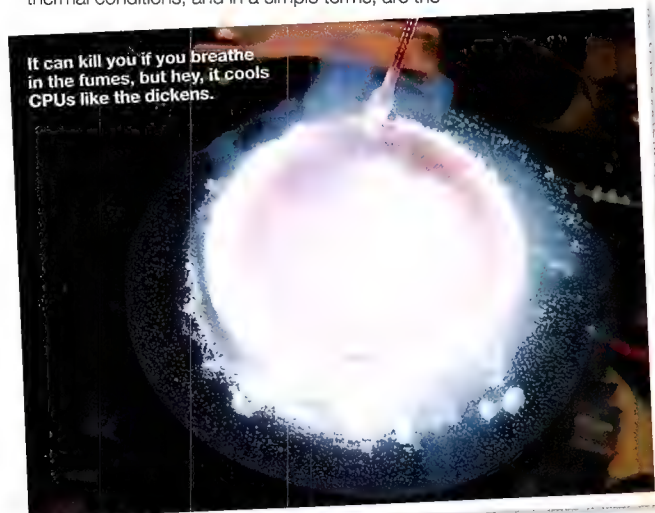
Our next noteworthy milestone was 4GHz with just 1.45V. This processor, now with all four cores operating at 4GHz, offered a huge amount of performance with an associated heat output to boot. Yet we knew there was more left in this chip, so we pushed even further.

Upping the voltage to 1.6V we managed 4.1GHz. At this frequency we ran two very quick benchmarks to get an idea of the speed of the processor. The QX6850 scored a Super Pi 4M calculation in 1min 12.453s and wPrime 32M in 13.953s – this thing was fast!

Not content, we decided there were two areas left undiscovered: We wanted to know what the max FSB this chip could handle, as well as how far it could go on dry ice.

After further testing, we obtained a maximum FSB of 505MHz – this is massive for a quad-core processor. With the dry ice subliming at an incredible speed due to the massive heat output, we obtained a 4.6GHz maximum frequency and a wPrime 32M run of 9.438s.

With exceptional power at stock and ludicrous performance when overclocked, this Core 2 Extreme rightfully holds the performance crown. This is, without a doubt, the ultimate processor available in today's market.



It can kill you if you breathe in the fumes, but hey, it cools CPUs like the dickens.

GIGABYTE GA-P35-DS3R

Josh Collins thanks the lads at the big G for this baby.



GIGABYTE GA-P35-DS3R

SPECIFICATIONS

Price **\$TBA** Street Price **\$200**
 Supplier **Gigabyte**
 Website **www.gigabyte.com.tw**
 Specifications **Intel P35 north-bridge; ICH9R southbridge; 8-ch ALC889A audio; 8x SATA; 1x EIDE; 8x USB; 1x PCIe x16; 3x PCIe x1; 3x PCI; 4x DIMM; 1333/1066/800FSB**
Socket 775.

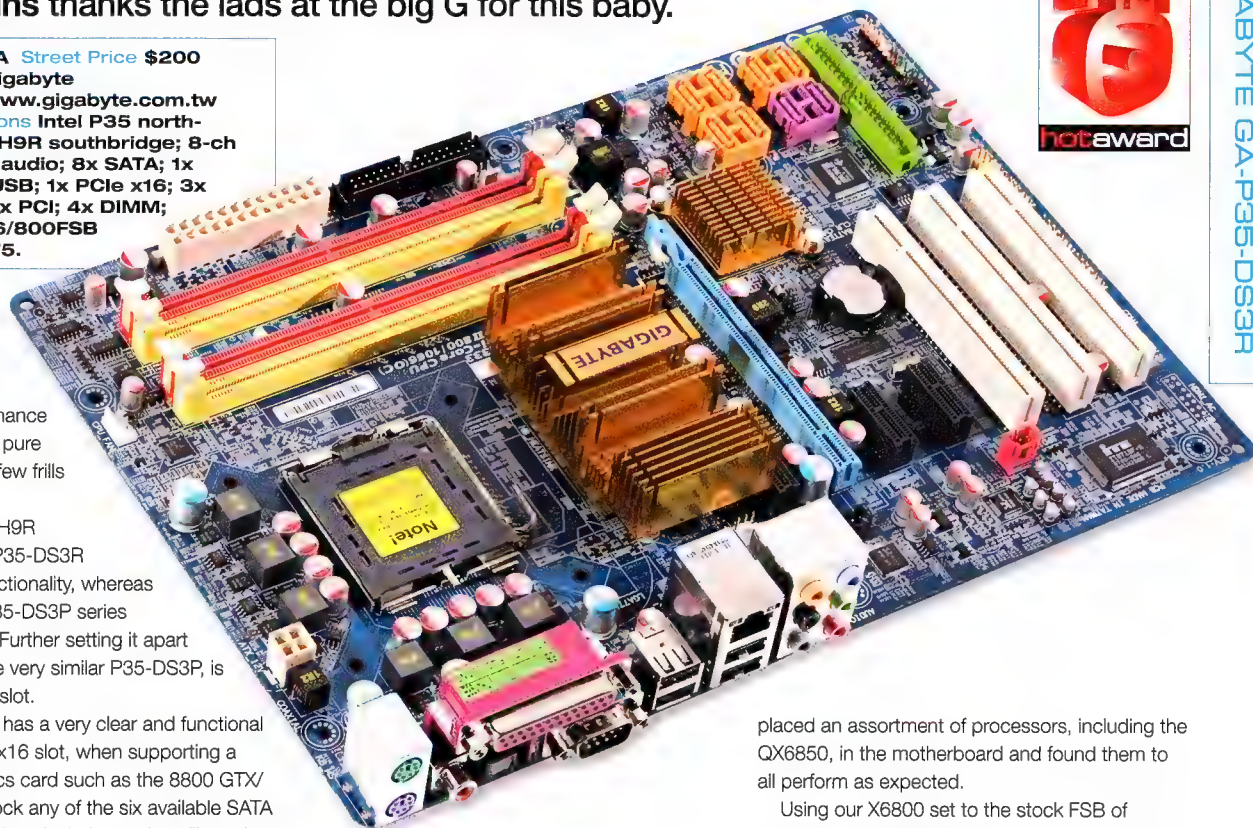
Based on the recent P35 Bearlake chipset, the DS3R offers entry-level performance for those after the pure essentials, with a few frills here and there.

Sporting the ICH9R southbridge, the P35-DS3R supplies RAID functionality, whereas its ICH9-based P35-DS3P series brother does not. Further setting it apart from the otherwise very similar P35-DS3P, is a single PCIe x16 slot.

The P35-DS3R has a very clear and functional design. The PCIe x16 slot, when supporting a monstrous graphics card such as the 8800 GTX/ Ultra, does not block any of the six available SATA II ports. A GPU with a dual-slot cooler will, on the other hand, block the CMOS clear jumper.

This brings us to an area of frustration. This bad placement is prevalent across GIGABYTE's whole P35-based range, from the P35-DQ6 to the P35-DS3P, down to the P35-DS3L, and over to the P35C-DS3R DDR2/DDR3 combination motherboard. Let's cross our fingers and hope that the next revision has the jumper in a better location such as the edge of the motherboard PCB. Of course, a built-in switch would be nice, but one step at a time.

The DIMM slots are well-positioned. This allows for adding or removing memory modules without the need to remove the graphics card – vital if you happen to be using a long-reaching card such as the NVIDIA 8800 series and AMD HD2900XT. GIGABYTE maintains the use of solid-state capacitors across its P35 series with the GA-P35-



DS3R sporting a full complement.

We find the heatpipe jungles and soaring finned towers that have become the norm for motherboard cooling to be a nuisance, so we were pleasantly surprised to find the DSR3 free of such devices.

The lofty heatpipe-threaded and multi-finned heatsink towers often interfere with the use of quality, third-party CPU and chipset coolers, so to finally have a motherboard that offers a simplistic, and not to mention effective, fanless chipset heatsink is a godsend.

The board features support for single-core, dual-core and quad-core processors – from 800MHz quad-pumped FSB chips such as the dual-core Pentium E2140, all the way through to the recently released QX6850. To test this, we

placed an assortment of processors, including the QX6850, in the motherboard and found them to all perform as expected.

Using our X6800 set to the stock FSB of 266MHz and a multiplier of nine, we gathered the essential benchmark scores.

The P35-DS3R scored 11167 in 3DMark06, 1min 38.328s in Super Pi 4M, and 30.187s in wPrime 32M. The suite was rounded out by Everest memory read, write and latency tests, where the system scored 7459MB/s, 4863MB/s and 68.7ns respectively.

Our next step was to overclock the motherboard. We managed a stable 500MHz FSB. Conveniently, with the processor multiplier set to six, this resulted in a 3GHz CPU frequency.

At the overclocked settings, the system scored 11,265 in 3DMark06, 1min 33.546s in Super Pi 4M and 29.500s for wPrime 32M. The difference between the Super Pi and wPrime results shows the gain from the increased bandwidth from the 234MHz increase over the stock 266MHz FSB.

Everest's memory read, write and latency tests returned 8724MB/s, 7952MB/s and 58.7ns respectively.

The GA-P35-DS3R is a pleasant motherboard to work with. Providing simplistic and effective overclocking and excellent layout and design, it's an affordable quality motherboard that would be at home in a basic gaming machine or sitting on an overclocker's test bench.

“Lofty heatsink towers often interfere... so to finally have a motherboard that offers a simplistic, not to mention effective, fanless chipset heatsink is a godsend...”



SCORE **9.0** OUT OF 10

TEAM Xtream Dark PC2-6400 C4

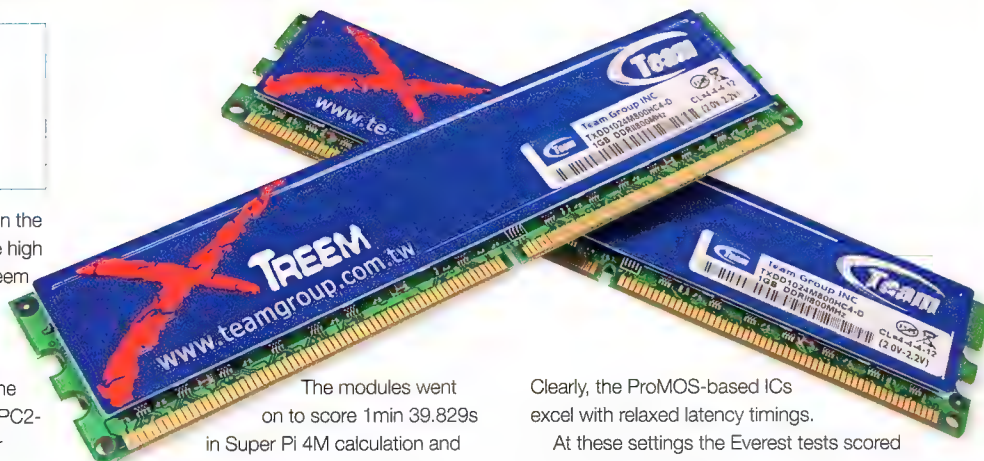
SPECS

Price **\$289** Street Price **\$289**
 Supplier **Nintek**
 Website **www.nintek.com.au**
 Specifications **DDR2-800;**
PC2-6400; 4-4-4-12 2T;
2.0V - 2.2V; 2x 1GB kit;
lifetime warranty.

The TEAM-Group brand is a major name in the high-end enthusiast scene, thanks to the high performance Xtream series. With the new Xtream Dark series, TEAM-Group now provides a quality option for the penny-pinching end of the enthusiast sector.

Based on ICs manufactured by ProMOS, the module's stock specifications are DDR2-800/PC2-6400, at timings of 4-4-4-12. They're cheaper than the high-end C4 memory alternatives that are commonly based on Micron D9 derivatives, yet provide higher potential performance than the value options commonly based on Elpida and Infineon ICs. The Xtream Dark sticks fill the void that exists between the budget and extreme kits.

With the X6800 running an overclocked FSB of 333MHz, a multiplier of nine and with the memory running in unlinked mode, the Xtream Dark modules ran flawlessly at the stock DDR2-800 4-4-4-12 2T specifications. The modules scored 8854MB/s, 6084MB/s and 57.8ns in the Everest read, write and latency benchmarks respectively.



The modules went on to score 1min 39.829s in Super PI 4M calculation and 29.015s in the wPrime 32M benchmark.

We then raised the memory frequency to find how far the modules could be pushed while maintaining C4 timings. The modules confidently ran DDR2-913 4-4-4-12 2T - a good score, though the Micron D9-based modules exceed this with ease. Consequently, we took a new direction with our overclock testing.

We raised the memory frequency further, maintaining the unlinked mode, as well as increasing the latencies to 5-5-5-15 2T. Pleasantly, these modules unleashed their hidden power, presenting us with DDR2-1142 5-5-5-15 2T.

Clearly, the ProMOS-based ICs excel with relaxed latency timings.

At these settings the Everest tests scored 8835MB/s, 6086MB/s and 53.1ns. In the Super PI 4M benchmark the sticks scored 1min 36.531s, as well as 29s flat in wPrime 32M.

These entry-level overclocking modules hit the nail on the head. With a good price and high performance, they'd make a strong addition to a budget gaming system. **JC**

SCORE **8.5** OUT OF 10

Kingston HyperX PC2-6400 C3

SPECS

Price **\$TBA** Street Price **\$TBA**
 Supplier **Kingston**
 Website **www.kingston.com**
 Specifications **DDR2-800; PC2-6400; 3-3-3-10 2T; 2.3V-2.35V; 2x 1GB kit; lifetime warranty.**

With DDR2-800 4-4-4-x the new norm for 'low-latency' memory, Kingston has taken it one step further, offering DDR2-800 modules with lightning quick 3-3-3-10 latencies. Many overclockers have been running these specifications for months now, but this is a first commercially.

The modules are guaranteed to do the tight 3-3-3-10 timings at DDR2-800 frequencies. This indicates high-binned modules designed specifically for low-latency. As such, you'd expect considerable overclocking at low latencies.

To test the sticks, we set the BIOS to run the memory in unlinked mode on our EVGA 680i motherboard. With the CPU FSB set to 266MHz, the processor multiplier at 11, memory voltage at 2.35V and the timings forced to 3-3-3-10 2T, we progressed to Windows.

The modules scored 1mins 38.750s in Super PI 4M, followed



by 29.015s in wPrime 32M. Rounding out the stock scores, the modules came through with 9098MB/s, 6086MB/s and 52.9ns in the Everest memory read, write and latency benchmarks.

Knowing we had some quality sticks on our hands, we decided to test the overclocking for both CAS 3- and CAS 4-based timings of 3-3-3-10 and 4-4-4-12. We managed DDR2-867 with 3-3-3-10 2T latencies and DDR2-1142 with 4-4-4-12 2T. At DDR2-1142 4-4-4-12 2T, the kit excelled.

With the CPU FSB set to 333MHz, the CPU multiplier lowered to nine and the memory at the previously stated DDR2-1142 4-4-4-12 2T timings, the modules scored 1mins 36.609s in Super PI 4M and 29.062s in wPrime 32M. In Everest's read, write and latency benchmarks, the sticks scored

9134MB/s, 6085MB/s and 49.8ns respectively.

Offering high performance at stock and overclocking further than you can throw your uncle Barry, these modules are perfect for a system tailored for low latencies. The Kingston HyperX PC2-6400 C3 kit will be at home in any performance enthusiast's system. **JC**

SCORE **9.0** OUT OF 10



Antec TruePower Quattro 850W

SPECS

Price \$330 Street Price \$TBA
Supplier Altech
Website www.altech.com.au
Specifications ATX PSU; 24-pin ATX; 4-pin ATX 12V; 8-pin EPS 12v; 2x 6-pin PCIe; 2x 8-pin PCIe; 9x 4-pin power; 8x SATA; 2x floppy.

Antec is offering some very potent and well-performing PSUs compared to the competition. Moving away from the Channel Well (CWT) OEM units that were used in many of the original TruePower and NeoHE-series power supplies, Antec has adopted Enhance-built units. Enhance is the supplier to other brands such as Cooler Master, Tagan and SilverStone, meaning Antec has a power supply with cousins that hold a substantial part of the market.

Rated at 850W, the unit has been built with the enthusiast in mind. Featuring two 8-pin PCIe connectors and a total of four PCIe power connectors, as well as a plethora of other necessary power connections, the Antec TruePower Quattro 850W is well-equipped for the needs of power-hungry SLI systems with over 10 hard drives. Add to this a colour scheme reminiscent of the V8 supercharged street machines of years gone by, and the Quattro boasts a bit of style as well.

With only a single 80mm fan to cool the unit, we

expected it'd *actually sound* like a V8. Fortunately for our ears and sanity, the Quattro 850W is very quiet.

Down to the gritty bits, we plugged the unit into our simple Antec power supply tester, which advised that the 12V, 5V and 3.3V rails were operating as specified. From here, we connected the system to an ASUS L1N64-SLI WS motherboard packed with 4GB memory, a pair of AMD FX-74 processors, an 8800 GTX and Western Digital 750GB WD7500AAKS hard drive.

The 12V rail reported a slightly higher 12.16V, the 5V reading being close to normal at 5.086V and the 3.3V reading slightly lower at 3.232V.

With sleeved modular cables, a quiet 80mm fan, a dashing set of GT stripes and competent performance, the new Antec TruePower Quattro 850W is an extremely tasty PSU we have no problems recommending.  **JC**



SCORE
8.5
 OUT OF 10

ANTEC TRUEPOWER

NETGEAR HDXB101 Powerline HD

SPECS

Price \$429 Street Price \$297
Supplier NETGEAR
Website www.netgear.com.au
Specifications Two adaptors; 200Mb/s interface; 10/100Mb/s Ethernet port; 1.82m Ethernet cable; config utility on CD; QoS.

Power line communication (PLC) technology has improved considerably since the first HomePlug standard was released in 2001. From a paltry 14Mb/s half-duplex, the latest standard, HomePlug AV, now sits at a comfortable 200Mb/s HD.

In essence, HomePlug devices allow you to transmit digital signals over the electrical wiring in your house, making it a bit of a compromise between cabled and wireless networking.

NETGEAR's newest HomePlug AV-compliant product is the HDXB101, a set of block-shaped plugs that connect directly to a power socket and act as Ethernet bridges. Included in the bundle is a configuration utility that makes use of packet capturing software WinPcap, and while it's a crude method, it allows you to set QoS and passwords, as well as update the firmware on the bridges.

The first thing you'll notice about the HDXB101 plugs is that they're monstrous. Your average dual-socket wall plate will be completely commandeered by one of these things, and power boards aren't much of a compromise seeing as they can degrade


the signal between units. The quality of your home's electrical wiring will also play a crucial role.

For our tests, we connected one HomePlug to an ADSL2+ router/switch, and the other to a PC on the same network. We then ran NetCPS to check average speeds, and ping for stability and latency. We also updated both units to the latest firmware.

The NETGEAR utility reported varying Tx and Rx speeds, but averaged 150Mb/s for both. It turns out these values were incredibly optimistic.

Over a direct Ethernet connection at full-duplex, NetCPS gave 11.05MB/s average, only a little shy of the theoretical 12.5MB/s. The HDX threw out a sad 2.27MB/s, well short of the advertised 200Mb/s (which is impossible over a 100Mb/s connection anyway) and closer to 18Mb/s. A two-way NetCPS reduced these speeds to 9.61MB/s and 1.68MB/s respectively.

The ping tests returned, unsurprisingly, a consistent <1ms response over direct Ethernet while the HDX averaged 3ms with spurts of up to 16ms. Neither connection had dropped packets.

With these results, we can't recommend the HDXB101 to anyone who wants to stream HD content, as the speeds just aren't there. Although the latency spurts are minor, we also can't recommend them to anyone playing online games. For browsing the web, they're fine, but that's about all they're good for.  **LB**



SCORE
6.5
 OUT OF 10

NETGEAR POWERLINE HD

ATOMIC

Our choice for
the best gear the
land has to offer

There's nothing sexier than new kit. And whether you need to horde your pennies (Budget), want the most power for your dollar (Performance) or own a small mansion and

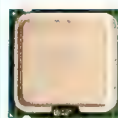
a collection of sports cars (Extreme), we're here to help with this handy matrix of Atomic recommended products. You may find your needs fall between categories – that's okay,

just mix and match to suit your budget! Each piece of kit has been reviewed hands-on in Atomic, so if you want to learn more, look up the issue and page number listed.

BUDGET

I can't afford to eat... gimme gear!

intel



Intel Core 2 Duo
PRICE \$100-\$480

Stretch a little further and buy yourself a Core 2 Duo – you'll be thanking yourself later. The E4400 is the cheap ticket to speed, at \$165.

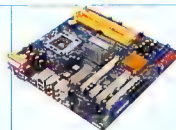
AMD



AMD Athlon 64 AM2 X2
PRICE \$135-\$335

Cheap CPUs are a wonderful thing, and the X2s are now wonderfully cheap. The 3600+ is your budget baby at about \$85.

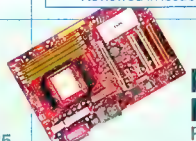
Motherboards



ASRock Conroe 945G-DVI
PRICE \$113

ASRock's budget board may be using old technology, but it runs the new stuff just fine, and can even overclock a little.

Reviewed in Issue 70 – Page 60



MSI K9N Neo F
PRICE \$113

Excellent performance from a budget board, with plenty of legacy slots for upgraders. Don't expect to overclock though.

Reviewed in Issue 68 – Page 33

Memory



Corsair Twin2X 1024MB 6400 Pro
PRICE \$198

Corsair has a history of providing nice, stable and feisty sticks of random access memory joy. These RAM sticks are EPP compliant, have low latency and are nicely overclockable. 800MHz of fun for everyone!

Reviewed in Issue 69 – Page 51

Video cards



Powercolor X1950 Pro
PRICE \$245

The X1950 Pro is nothing short of fantastic. Mind you, this could just as easily be the 7950GT, so watch this space in case the NVIDIA card drops in price.

Reviewed in Issue 71 – Page 47

PERFORMANCE

Hardware that bangs the best for buck.

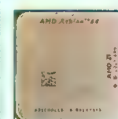
intel



Intel Core 2 Quad
PRICE \$300-680

Core 2 Quad – a processing powerhouse, now affordable and overclockable like buggery. The Q6600 is the best buy, at about \$336.

AMD



AMD Athlon 64 AM2 X2
PRICE \$135-\$335

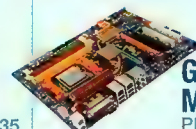
The X2 series are still fantastic chips, and in the face of the Intel threat are now going for cheap. The 6000+ is your current sweet spot at about \$235.



Gigabyte GA-P35-DS3R
PRICE \$200

The P35-DS3R is a cheap overclocker that can't be ignored. Buy a Core 2 Quad Q6600 and go nuts!

Reviewed in Issue 80 – Page 55



Gigabyte GA-M59SLI-S5
PRICE \$250

Gigabyte delivers yet another affordable, feature-filled wonder of the 21st century.

Reviewed in Issue 66 – Page 39

NEW ENTRY



TEAM Xtrem Dark PC2-6400 C4
PRICE \$289

Cheap, overclockable and good lookin' to boot. The modules fill the void that was previously left between cheap value RAM and enthusiast overclocking kits.

Reviewed in Issue 80 – Page 56



GeForce 8800GTS 320MB
PRICE \$410

DirectX 10 for the mainstream. 320MB is as good as 640MB in most situations – opt for the 640MB if you're going to play above 1600x1200.

Reviewed in Issue 76 – Page 58

EXTREME

Gimme power. Money is no object.

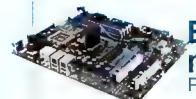
intel



Intel Core 2 Extreme QX6850
PRICE \$1478

Extremely powerful and a strong overclocker to boot. The Q0 stepping is truly drool worthy.

Reviewed in Issue 80 – Page 52



EVGA nForce 680i
PRICE \$435

Stupidly over-featured and fast, if you've got the cash, then plonk it down here.

Reviewed in Issue 72 – Page 47

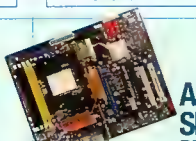
AMD



AMD Athlon 64 FX-62
PRICE \$1072

Sadly gets beaten by a mid range Core 2 Duo, but still the top of AMD's pile.

Reviewed in Issue 66 – Page 39



ASUS M2N32 SLI Deluxe
PRICE \$290

Perfection in a motherboard. Beautifully laid out and overclockable to boot.

Reviewed in Issue 68 – Page 35



Corsair Dominator Twin2X 10,000
PRICE \$1016

Crazy speed sticks that will also happily do 1T/800MHz/3-3-3-3. Comes with a fan attachment to keep things cool!

Reviewed in Issue 77 – Page 58



XFX GeForce 8800GTX Ultra XXX Edition SLI
PRICE \$1459x2

This is far and away the most powerful graphics card on the market, but be willing to sacrifice your entire retirement fund for the privilege of having one of these tearing up your screen.

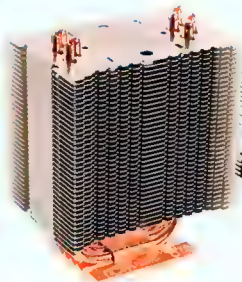
Reviewed in Issue 78 – Page 59

'Bringing Atomic the hottest brands & low prices'

nintek

AUSTRALIA'S LEADING COMPUTER RETAILER

Coolers



Noctua NH-U9F
PRICE \$80

It may only be 90mm, but its cooling power is exemplary, coming in only slightly behind its 120mm brother.

Reviewed in Issue 72 - Page 42

System drives



Samsung HD160JJ 160GB
PRICE \$80

Super quiet and yet still fast, the 160GB Samsung offers excellent value for money.

Reviewed in Issue 69 - Page 40

Displays



Samsung 931C
PRICE \$405

2ms of raging colour gamuts and beautifully smooth tonality that will make you weep with joy and hug strangers.

Reviewed in Issue 70 - Page 56

Speakers

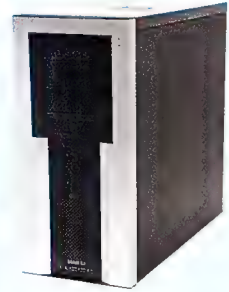


Steelcase 5Hv2
PRICE \$120

Awesome gaming audio performance on a shoestring budget. Phenomenal 'phones.

Reviewed in Issue 73 - Page 43

Cases



Lian Li PC-7S
PRICE \$138

Quality, elegance, refinement and style. The trademarks of a Lian Li case, now available at an entry-level price.

Reviewed in Issue 79 - Page 46

Thermalright Ultra 120
PRICE \$75

Tower cooling that will keep your tower cool. Whack a Nexus 120mm fan on for near silent cooling.

Reviewed in Issue 72 - Page 42



Seagate Barracuda 7200.10 320GB
PRICE \$130

Seagate's fancy new technology makes this beast both fat and fast. Mmm, toasty.

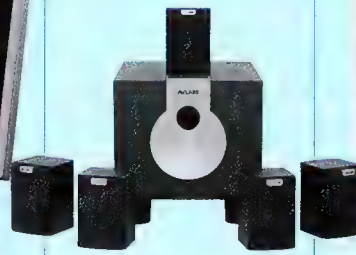
Reviewed in Issue 69 - Page 40



Samsung 244T
PRICE \$1477

Brilliance at 24", the 244T offers 6ms gaming, a wonderful gamut and more inputs than an alien hooker.

Reviewed in Issue 69 - Page 48



AVLabs AVL325
PRICE \$165

While it can't hold a candle to the Z-5500D, with a price this low there's no excuse not to jump to 5.1.

Reviewed in Issue 64 - Page 50



Cooler Master Stacker 830
PRICE \$290

Like the Stacker before it, this sensational Stacker stacks sumptuous specifications salaciously.

Reviewed in Issue 61 - Page 36

Thermalright Ultra 120
PRICE \$85

Make sure you get the optional AM2 bracket (hence the higher price). Grab that same Nexus fan.

Reviewed in Issue 72 - Page 42

Asetek Vapochill Lightspeed
PRICE \$1020

Vapour phase change. Ooooh. Vapour. Phase. Change. No matter how many times you say it, it's still cool (pun!).

Reviewed in Issue 64 - Page 38



Western Digital Raptor WD1500AFD
PRICE \$330x2

Dear lord. The performance king hath cometh, short of whacking in a SCSI. Buy two and RAID 'em.

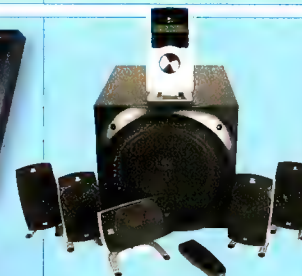
Reviewed in Issue 62 - Page 40



Hewlett Packard LP3065
PRICE \$2718

Thirty inches, 2560 x 1600, 8ms G2G. If you can handle the size and cost to run this massive beauty, you won't be disappointed.

Reviewed in Issue 76 - Page 53



Logitech Z-5500D
PRICE \$430

Able to play the 'liquid gold' that is DTS 96KHz/24-bit, this 5.1 beast can wreck both home and hearing alike with equal impunity.

Reviewed in Issue 48 - Page 56



Silverstone TJ07
PRICE \$420

The Silverstone Temjin TJ07 is a huge hulking beast that shows you mean business in the finest style. Impeccable finish and plenty of room means win.

Reviewed in Issue 65 - Page 49

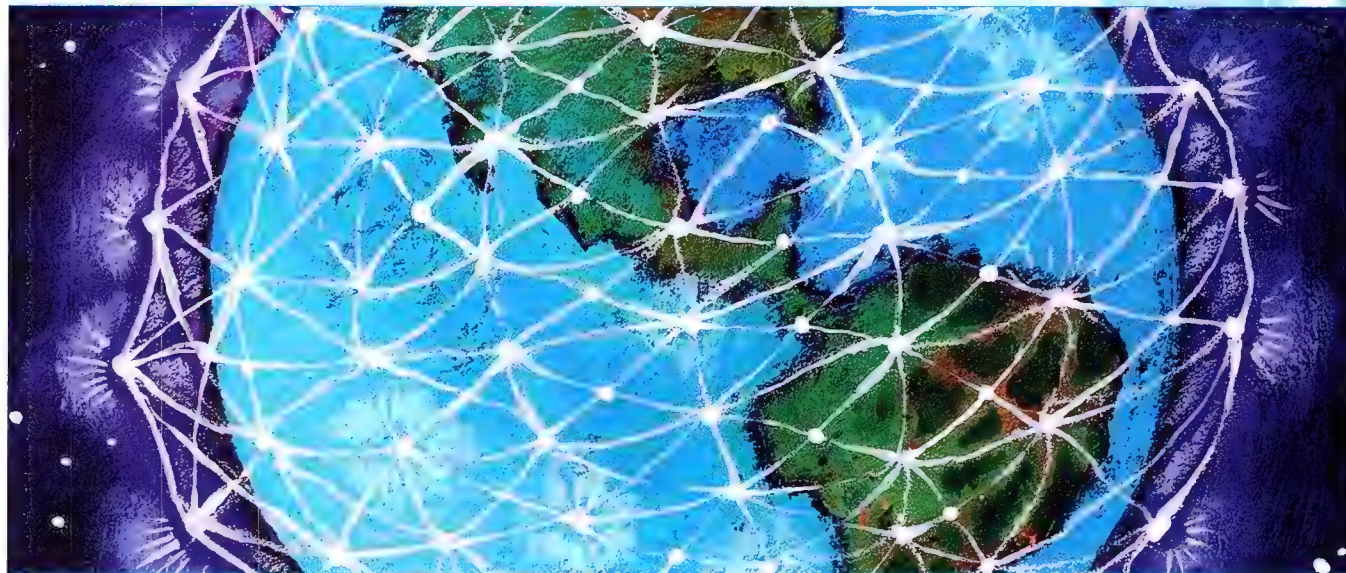
Cool-Trek Vostok
PRICE \$199

Until more extreme cooling systems come along that are AM2 compatible, this little kit will have to fill the gap. Make sure you get the updated mounting kit.

Reviewed in Issue 68 - Page 41

GROUNDZERO

Dan talks tech
like you've never
heard before.



Impossible antenna, only \$50!

Daniel Rutter explains the unnatural as being very natural.

If you want more range for a wireless network, you buy a bigger antenna. There are repeaters and power boosters and other such things, but a bigger antenna's usually part of the recipe. More power only allows a wireless device to be heard farther away, after all; a bigger antenna should allow it to *hear* farther away, as well.

Most add-on Wi-Fi antennas are impossible. They just can't exist.

What's written on the box is contrary to physical laws.

Most consumer products don't have this problem. That can of Cola may not actually make you thin and sexy, that burger may not look like the picture above the counter, but nothing about the product description violates any rules of nature. There aren't a lot of negative-350-millilitre cans or square-root-of-minus-one-pounder burgers out there.

And yet it is quite easy to purchase 'omni-directional' Wi-Fi antennas with gain.

Gain is a way of describing how much stronger an antenna's output signal and input sensitivity are than some reference signal. In the case of Wi-Fi antennas, gain's specified in 'dBi', which stands for 'decibel isotropic'.

A 3dBi antenna has a 3dB, or twofold, gain advantage over a theoretical perfect isotropic radiator. That radiator spits out all of the power that goes into it evenly around it in a perfect sphere, and is similarly perfectly evenly sensitive to incoming signals.

That perfect isotropic antenna also wastes no power at all. Every picowatt of power that goes into it is emitted.

So an 'omni-directional' antenna... with 3dBi gain... would have to somehow emit twice the energy as you pumped into it.

Unfortunately for people keen on the ongoing search for machines that run on nothing, this is not actually what a 3dBi omni does. What it actually does is just... cheat. Omni-directional antennas are not actually omni-directional at all, and the higher their 'gain', the less omni-directional they are.

This is connected to the fact that the theoretical perfect isotropic radiator is *another* thing that can't actually exist in the real world. For the same

reason that you can't get a perfectly isotropic light bulb, or a perfectly omni-directional microphone, you can't have a perfectly isotropic antenna. Awkward facts of the physical world mean that the structure of a light bulb blocks the light the bulb emits in some directions, and that the structure of a microphone blocks some of the sound that's trying to get to the mic diaphragm.

And so it is with antennas. Your typical 'rubber ducky' Wi-Fi antenna, as seen on most access points, has a quite noticeable 'null' lined up with its

axis. If you point the antenna (or antennae) of your AP at your Wi-Fi computer, you'll probably notice the signal strength fall quite a lot.

Now, the vertical null is actually quite a good thing as it prevents the antenna from wasting power on the sky above it and the ground below it, where Wi-Fi clients are unlikely to be. But the higher the gain of an 'omni-directional' add-on antenna, the wider the cone becomes above and below the axis of the antenna where it doesn't work well, or even at all.

If a high-gain 'omni' antenna's vertically aligned, and you're roughly level with it, then you'll get more signal than you would from a smaller 'omni'.

If you're not sitting in the narrow signal disc around the antenna created by its high gain, though, you're likely to be very dissatisfied with the performance of your new super-antenna.

This is, of course, only the tip of the iceberg of mystic antenna voodoo, but the rest of it doesn't announce its presence with a blatantly paradoxical product description, though.

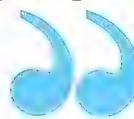
You know, I don't think I'd mind if this sort of thing happened more often. People might think before buying \$500 jeans if the label said they were Klein bottle pants that could make your bum disappear.

Dan's signal cone grows stronger when thinking about high-gain antennas.

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GAMEPLAY

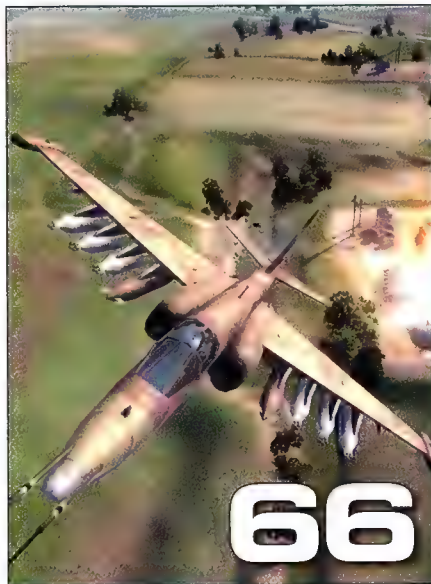
GAMES, GAMING AND GAMERS COVERED ATOMIC-STYLE

Ah, the game drought is finally coming to an end. Well, except for that damn dirty Crysis, getting itself delayed and all. Where Crytek gets the nerve!

No worries though, as this month we have a feast of gaming delights to keep you occupied. First up is *World in Conflict*, the technical details of which are covered in Engine Room. With this impressive starter swimming

in your belly, you can chomp down on tasty treats such as *Ninja Gaiden Sigma* and *Two Worlds*. And, to top it off, is a review of *Day Watch*, the sequel to the creepy *Night Watch*, and the hair-filled *Afro Samurai*.

Next month, look forward to *BioShock* and *Jericho*. That's what we're praying for.



GAMEPLAY CONTENTS

Geekette 82
Kate Inabinet can't imagine what Ubisoft was thinking.

Engine Room:
World in Conflict 66
Logan Booker joins the Red Army to get the latest on Massive's explosive new action RTS.

Game reviews
Ninja Gaiden Sigma 72
Guitar Hero 80s 74
Two Worlds 76

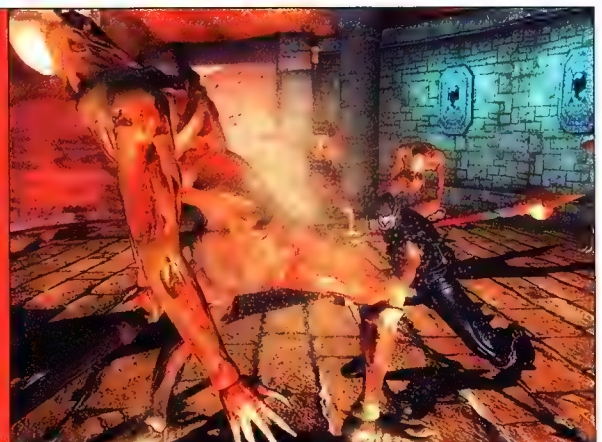
Culture Shock reviews
Day Watch 80
Sex.com 81
Harry Potter & The Deathly Hallows 81
Afro Samurai 81

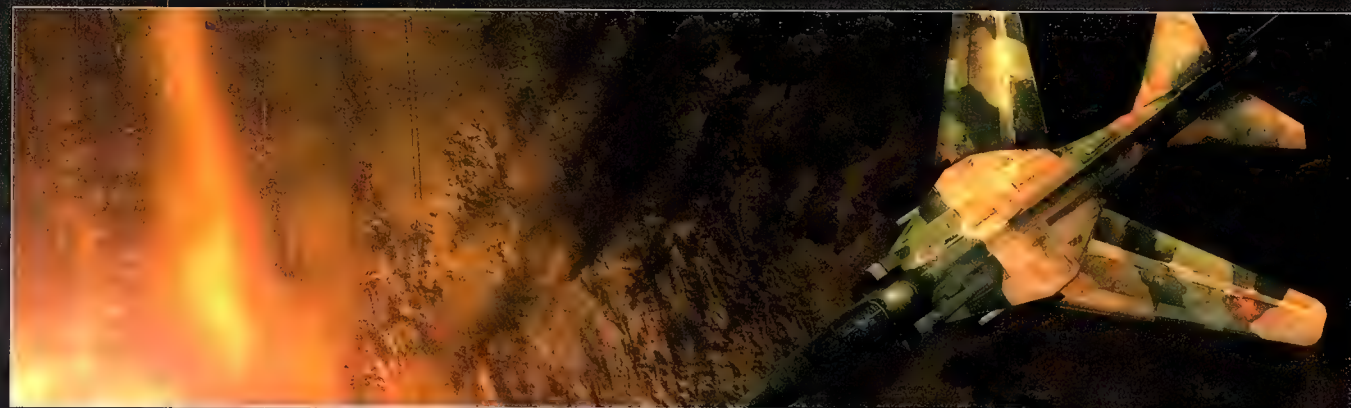
**Win 1 of 5 copies of
Ninja Gaiden Sigma!**

www.atomicmpc.com.au/competitions

This competition begged us for a ninja cliché – more so than a walrus does his bucket. Anything with robots or pirates would do, it said. Luckily for you, we're not going to lower ourselves to its level! What we are going to say is that we have five copies of *Ninja Gaiden Sigma* for PS3 to give away, thanks to Atari (www.atari.com.au).

To go in the draw, just visit the URL above and answer the question for *Ninja Gaiden* you find there.





CONFLICT of INTEREST

Logan Booker recruits the help of Massive's Niklas Westberg to discuss the terms of the developer's upcoming action RTS, *World in Conflict*.

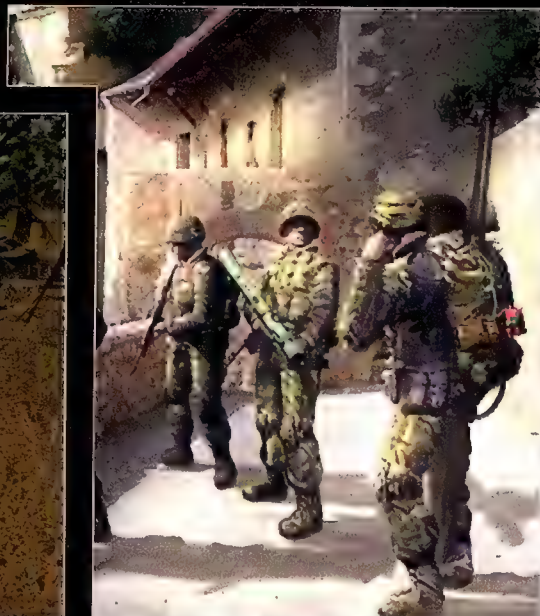
Did the world have a rough time of it during the Cold War? One would think the threat of an all-out, nuclear-fuelled conflict would have caused more than a few heart palpitations during those tense years of uncertainty and fear. Fortunately, we managed to get out from under that potential cloud of radioactive particles; now we just put up with your run-of-the-mill rain-filled ones that don't demand the services of a lead-lined umbrella.

As with any major fork in history, authors and filmmakers have seen fit to explore the events that could have taken place had the Cold War continued. Visit your local bookshop and grab Tom Clancy's *Red Storm Rising* or Robert Ludlum's

The Scarlatti Inheritance for a few insights or, if the old literary glands aren't up to the task, pretty much any James Bond film. For those who want a taste of something more poignant, you can't go past the 1960's *Fail-Safe*, available in both novel and film form.

With games having achieved a degree of maturity and sophistication in recent years, the media is more than capable of handling its own 'what-if' scenario involving a prolonged and

Top It's 'plane' sailing if you're in a jet.
Right Soldiers discuss tactics. Or chicks.
Below 'Tanks' for the memory!





violent Cold War. Massive Entertainment feels that it is the studio to attempt such a project, naming the endeavour 'World in Conflict'. We had the opportunity to speak with Niklas Westberg, technical director on the game, about some of the specifics of the title.

Say no to NATO

'World in Conflict is a tactical strategy game that takes place in 1989, in a fictional universe where the Cold War didn't end,' explains Westberg.

'In this scenario, the Soviet Union decides, for a number of reasons, to attack Europe and the United States. The game is very fast-paced and action-focused, with an emphasis on teamwork.'

The nitty-gritty of the story sees the Soviet Union desperate for global supremacy, the Communist-based superpower struggling under the weight of its economy. Its solution is to attack Europe along with the US, embroiling the world's most prominent continents in war. According to Massive, all of the aforementioned nations are available as theatres of conflict in the game, with the first missions of the single-player campaign concerned with retaking small parts of the United States.



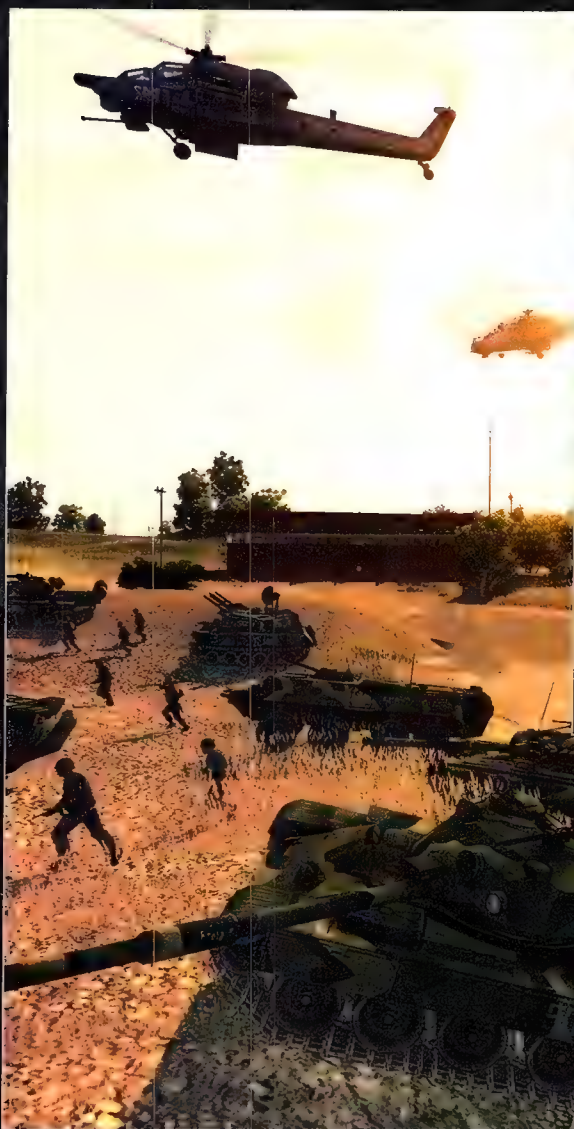
Top Your average town, now with added explosions. Above Helicopters support a ground assault. Left Now's about the time you should think about running.

World in Conflict is a significant thematic departure for Massive, with its most recent games being the Ground Control series, set in outer space and involving aliens and sci-fi technology. The gameplay between the titles however is similar, with tweaks here and there.

The biggest change is the removal of resource gathering. While it was never a major element in Ground Control II, it was still a concern for the player. With World in Conflict, players are provided a set amount of resources at the start of the game, which determines how many units they can call in. As these units are destroyed, the player will slowly recoup resources, but never more than they originally started with. According to Westberg, Massive did not, at any point during development, consider adding resource management, or other staple RTS mechanics, such as base building. Massive had a fairly good idea of what it wanted early on.

'The game design process is a hard one, and you rely on feedback from numerous people. But at one point, you really just have to let go of all the ideas and start the focused development. By then, the game designers' words are law, and the plan is pretty much set,' he says.





Top Did those tanks just come out of the water?
Below Why do the churches always survive?

Ground controlling

World in Conflict incorporates many concepts introduced in Ground Control, only more evolved. Massive is well-known for developing real-time strategy games that bend the rules of the genre.

For example, camera control in World in Conflict is much more flexible than that of other RTS games, as it was in GC. Players control the position of their viewpoint using W, A, S

and D – the standard keys of almost all first-person shooters. Depressing the middle mouse button allows up-and-down movement (and can be inverted), and with the hassles of base-building and resource gathering gone, the player is free to focus on pure tactics and, of course, the action.

This direction undoubtedly allows the game to translate better to the Xbox 360, which will share a release with the PC version. In fact, World in Conflict may be the first real-time strategy game ever to seriously consider the needs of the console gamer, usually forgotten in a genre owned totally by Windows-wielding hardware.

Completing the Microsoft trifecta, World in Conflict will sport the Games for Windows tag, but unlike Shadowrun, which also saw a PC/360 release, WiC will not support multiplayer between the two platforms.

'Since the Xbox 360 version is tailored for the console, we felt that the two games weren't compatible with each other in regards of balancing, and the different input devices,' explains Westberg. 'We've put all the effort into making both versions as enjoyable as possible on their own, however, and I'm sure both 360 users and PC users will have a blast with the game.'

With standard RTS elements discarded, unit micromanagement will play a larger role. Most units have at



'We like to develop our own engines as we have some of the best tech developers there are.'



can be spent via a drop-down menu in the top-left of the game window to deploy paratroopers, air-to-air strikes, artillery and, if you can afford it, tactical nukes. Variable point spends for individual tactical aids are also available, and increase the strength, size or duration of the strike.

Cold War 2.0

The gameplay of *World in Conflict* is but a small part of the development story. Massive, for each of its games, has designed its own engine technology, and *WiC* continues the trend.

'We like to develop our own engines as we have some of the best tech developers there are,' says Westberg.

'What engine we'll be using on our next project is still unclear, though, since it's not even been decided what that project is. It's very likely that we will keep developing our own engines, since we can respond quickly to the project's needs.'

A possible advantage of purchasing a license to another engine, such as Unreal Engine 3, would be the ability to focus more on the game itself, rather than the chunks of code that make it work. Westberg is of the belief however, that designing the engine in-house has actually helped



Top left Remember, the nukes can't hurt you if you cover your eyes.
Bottom right Bombers do their thing.
Below Top-down view of the carnage.

least one special ability, and heavy vehicles often have two. Tanks can deploy smoke to make them harder targets, or launch SABOT rounds to penetrate thick armour, while jeeps can fire rocket-propelled grenades.

These abilities have a cooldown, so timing will be crucial to maximise their effectiveness.

Players can cater their side to their particular style by choosing one of four arms of the military – tank, air, support and infantry. While a base selection of units is available to all arms, players are afforded discounts and specialised troops unique to their arm.

Support is probably the most ambiguous arm. Essentially, it gives access to off-map bombardment, repair trucks and anti-aircraft units.

Wrapping the gameplay up in a nice bow are tactical aids. Tactical aid points are a separate resource to the points used to buy units, and supplied much more slowly. At any time, they





Top A glorious sight made possible by MassTech. Right World's worst job. Below Off for a smoked kipper after a bomb well dropped.



with the development of the core game.

'This way, we're making sure that we get all the features that we want. The engine is tailor-made for our game, and we can use it to its full capacity. I don't think World in Conflict would be what it is today if it weren't for the fact that we do use our own engine,' he says.

Westberg does point out that whether to create technology in-house or to buy something pre-packaged is a choice that has to be made on a project-by-project basis.

'It all depends on the type of game you're making and what your focus is. If you save time and money, and can reach the same results as you would with your own engine, then there's no reason to build your own engine just for the heck of it.'



Previously we mentioned that World in Conflict would be one of a new breed of games stamped with the 'Games for Windows' brand. We're pleased to say that this moniker wasn't included simply because WiC is available on PC. Massive has worked hard to include DirectX 10 support in its new game. A DirectX 9 renderer is available to users of Windows XP, but if you own Vista and a DX 10-compliant card, additional visual splendour and performance awaits.

'We've worked on some DX 10 features for a time now, and we're going to have it available in the retail version,' says Westberg. 'DX 10 is just a natural development of the graphics, and we have some features that make the DX10 version of World in Conflict look absolutely amazing.'

Part of the 'absolutely amazing' is the particle effects engine, which, with the help of both the coding powers of Massive's programmers and the delicate hands of its artists, really makes WiC one of the most gorgeous real-time strategy games to arrive in recent years.

'They've worked very close to each other and have really pushed the envelope of the technology. We can't wait to see what they can do with the next-gen tech,' says Westberg.

According to Massive, the average shader program in WiC is ten times longer than that of Ground Control II, and the algorithms for adjusting levels of detail on-the-fly are about as smart as they can get.

Naturally, the game will be optimised for multi-core systems – a must for the Xbox 360 and a growing concern for the PC. WiC's engine is intelligent enough to divide numerous

workloads, including a few graphics-related ones.

'The main thing is that we run physics on a separate core, but we also run smaller tasks like particle updates, shadow volume extrusion and tree updates on separate cores, if available.'

Another nail in the coffin of the PhysX processor, we suppose, considering WiC also makes use of Havok.

In Soviet Russia, game plays you!

Westberg confirms that extensive modding support will be available for the game, so enthusiast players can customise WiC to their heart's content. It also assures the title will have a lifespan beyond six to 12 months.

'This includes a map editor and being able to script new unit behaviours. We want to make it as extensive as possible, but that of course puts some demands on the people who want to mod it. But we're trying to make it as easy as possible by providing the community with proper documentation,' he says.

It hasn't all been smooth sailing for Massive, however. The design of the engine and, ultimately, the game itself, had coders and artists butting heads over what was possible to accomplish with the time and technology available.

Westberg says that the developer solved many of its development problems by creating 'task forces' to tackle specific dilemmas.

'It worked a lot better than to have them communicate via documents and email.'

At the time of writing, keys for the closed beta are available via the official WiC website: www.worldinconflict.com/beta. It's your chance to try the game out and provide feedback before it hits shelves.

'The game's very stable for being in the beta phase, and we have over a month left to nail the last bugs and do that



important last bit of polish. It's looking good,' says Westberg.

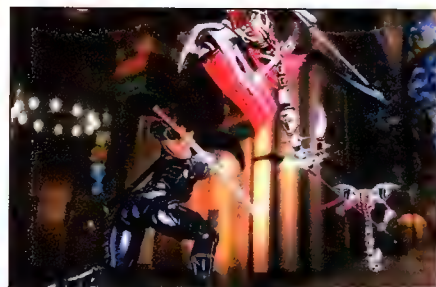
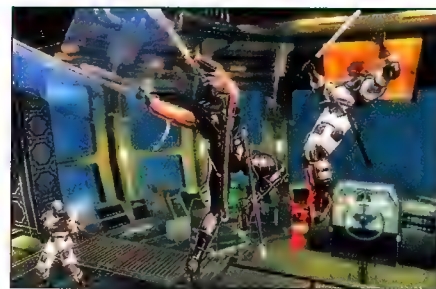
Before we left Niklas, we asked if he felt there was anything he would change about the game if Massive could do the project over again. While admitting that there's always room for improvement, he is, overall, pleased with how World in Conflict has turned out.

'We've worked with this for so long now, and we've put so much effort into making it as entertaining as possible,' he says.

'At this point, we're very happy with what we've done, so we're too busy focusing on getting it done than to wonder what could have been done differently. All the nice feedback from the tests we've had just makes us all the more confident that we're doing the right thing.'

Above WiC has excellent visuals for an RTS. Below it's almost like they're just waiting to be destroyed.





Ninja Gaiden Sigma

Chris Booker likes dressing up as a ninja, but that's not really any of your business.

Ah, ninjas. Pyjama-wearing death machines, unconditionally lovable unless you happen to have a contract out on your life, in which case you probably live in abject fear of them. If this sounds like you, *Ninja Gaiden* will serve as the perfect way to study your enemy, or to pass time until they come for you. While the educational value will be lost on the rest of us, it's still a pretty fun game, even if it's almost identical to the original Xbox version.

You assume the role of Ryu Hayabusa (great ninja name), son of Joe Hayabusa (not-so-great

ninja name). The pair is descendent of the Dragon lineage, and thus one of the few capable of wielding the Dragon Sword and the evil Dark Dragon Blade. Joe has placed the Dragon Sword in Ryu's care, and left the Dark Dragon Blade in the safe-keeping of their ninja village. While Ryu is training, the village is attacked and the Dark Blade stolen, and it's up to Ryu to get it back and seek vengeance for his destroyed village.

Ninja Gaiden Sigma is a mix of *Resident Evil* and *Soul Calibur*, though the emphasis is

definitely on the fighting. You explore each map, finding and mixing items to solve puzzles, and using various button combinations to produce effective, and slick-looking, attacks. One moment your enemy is across the room, the next you're in the air as a fast-moving blur, preparing to decapitate him. The amount of moves is on-par with that of the previous games, so much so you most likely will not bother with most of them, and just settle on a few that you find to be effective.

You can also choose to fight with different weapons, from dual-swords and staves, to nunchucks. So pretending to be your favourite ninja turtle is very easy, so long as it's not Raphael. You can upgrade your weapons at blacksmiths dotted through-out the game, as well as buying various other items that will replenish your health, teach you new moves and restock your ammunition for various weapons.

The *Resident Evil* element comes in as you explore. You can examine some items, for example a filing cabinet, and it will say something to the effect of 'Lots of paper-work, none of it useful to me'. You know, just for ambience. You





will also come across locked doors, which will sometimes require a button to be pushed or a key card to be found. The more interactive ones will have you running around looking for a few items that need to be combined.

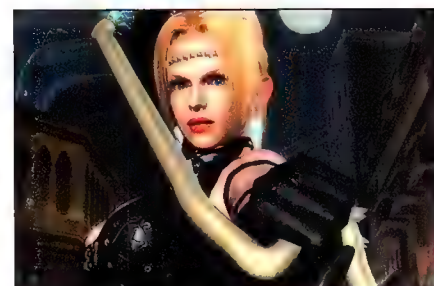
A further complication to Ryu's skills is his 'Close the distance between me and my ranged attacker' move, which is the exact same button combination as 'Leap in the air and do a big, slow attack that takes a few seconds to recover from leaving you helpless' move.

The only variable is if the enemy is the correct distance (not too close, not too far) away. Too close and Ryu does move B and falls short, too far and again Ryu does move B and, while looking cool flying through the air, leaves himself completely open. While this is only one move, it's a big one, and it can prove extremely frustrating.

Another frustration is the door-opening button is the same as the attack button, so expect to frequently jump between sections inadvertently when you're ambushed in a new area.

With a title like this, you'd expect some pretty nice graphics, and that's exactly what you get, if a little Spartan and with textures a tad washed-out – a symptom of upscaling and lazy porting. As with any third-person action title, the camera can be placed in annoying positions, but fortunately, Temco has had a pretty good crack at getting it right.

Ryu Hayabusa comes free with flashy ninja moves, shiny ninja weapons and a secret ninja destiny to fulfill. It can be frustrating at times, but *Ninja Gaiden Sigma* is a fine title worth owning, especially if you haven't played the original or Black versions.



Developer **Team Ninja**
Publisher **Temco**
Website ninjagaidengame.com
Players **1**
Other platforms **N/A**

VERDICT

Looks slick; cool ninja moves; new content; muscle men in spandex.

Frustrating combos; door open button same as attack; same old *Ninja Gaiden*.

SCORE **8.0** OUT OF 10



Guitar Hero Encore: Rocks the 80s

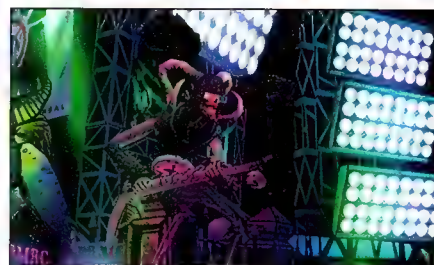
David Field finds the mediocre, generic sound he's been looking for.

Guitar Hero. Literally translated (into Swahili, then back into English), it means dangerously addictive fun. It's the kind of game that will make you gleefully throw away hours of your life. Take it from us and its legions of fans who are now nodding in sombre agreement.

So what to make of the jumpsuit-wearing, hairspray-fuelled pseudo sequel? The short answer is that Guitar Hero Encore: Rocks the 80s is a glorified map pack. Which is by no means a bad thing, but don't expect

any revolutionary changes. In fact, the fewer changes you expect the better. The same coloured Dance Dance Revolution-esque scrolling blobs still tell you when and what frets you should be hitting, and when you do, the same Guitar Hero 2 action will greet you.

The characters, newly-skinned in big hair, red/green 3D glasses and hot pants, are fundamentally the same as GH2. Except there's less of them. The backgrounds, given a quick once-over with an assortment of coloured



highlighters, are the same. Except you don't get Stonehenge. Even the menu system and structure is ported from GH2, except it's in hot pink now. And the guitar selection? Same as GH2, baby.

Of course the rich, creamy centre of Guitar Hero is its songs and how they're mapped to the controller. The hardcore will be glad to know that they are more difficult. What would have been a simple single fret in GH2 has now become a two-fret challenge, which means you can't fumble your way across the controller hoping to hit the right note while conveniently ignoring the ones below it that you happen to be leaning on.

Fun songs are all well and good, but fun and memorable ones would be better. This point will depend on when and where you were in the 80s, but the vast majority of the tracks are very America-centric. Some of them are standouts,





like *Ballroom Blitz*, *I Think I'm Turning Japanese* and *Bang Your Head* (Mental Health). Black Sabbath is one of the few English rock bands representing the international stage, and as you play through Encore 80s you'll wonder why the likes of Dire Straits, Queen and Acca Dacca are conspicuously absent.

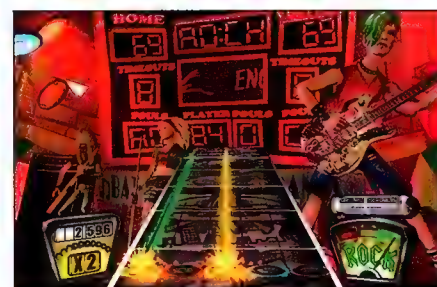
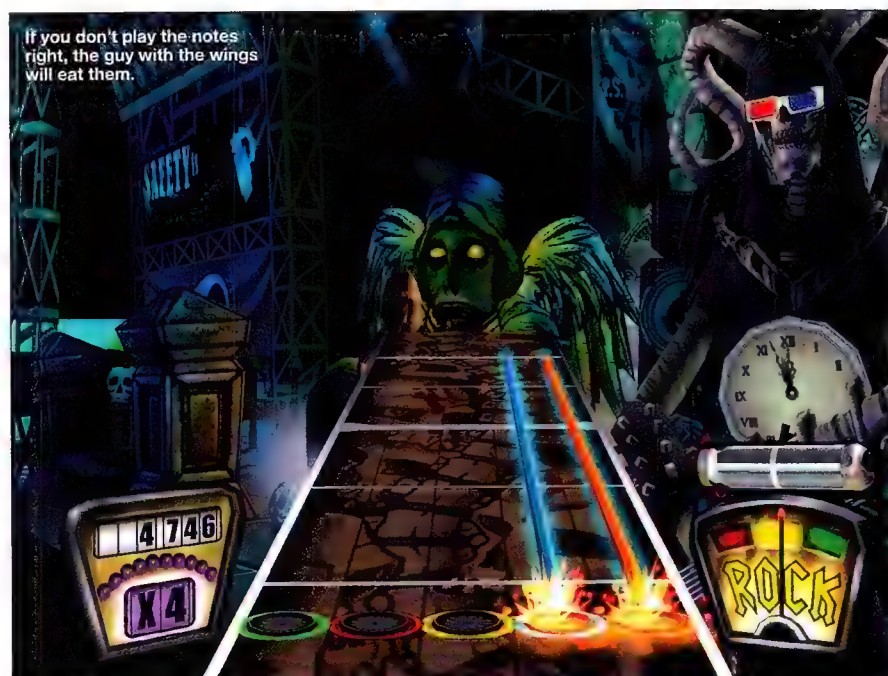
After blazing through the first half of the game on Expert, insane and seemingly random sets of notes will start to hit you, causing you to jump all over the fret board with RSI-inducing finger gymnastics.

From a player's perspective, it almost like you're the victim of an internal developer contest to see who could place the most chords in the shortest section of the song. This aside, hugely experienced players (such as us, we

say with little to no haughtiness) will find about four hours of manic grin-inducing gameplay before reaching the last song.

We still love it, but \$70 is a bit steep for what you get. Encore 80s only gives you 35 tracks. Compared to GH2's 40 tracks and 24 bonus tracks, it's a letdown with less longevity than its predecessors. Imagine for a moment, as we did, how you would have felt if a stack of 80s movie themes were in there as bonus tracks. *Back to the Future*. *Bill and Ted*. *Ghostbusters*. Sadly they aren't, and you're left with a sinking feeling of incompleteness.

Of course, this won't stop fans of the series from picking up the game and enjoying it. However if you wait until the price drops to \$50 before you do, we won't blame you.



PS2

Developer **Harmonix**
Publisher **Activision**
Website guitarherogame.com/gh80s

Players **1-2**
Other platforms **N/A**

VERDICT

Classic hits from the 80s;
new skins; 3D glasses.



Looks exactly like GH2; small
song selection; feels like a
money-grab.



SCORE
7.5
OUT OF 10

Not even a 50-foot demon spewing flames from his arse could influence the plot in *Two Worlds*.



you to awaken it in exchange for your sister's life.

In addition to the main quest, there are sub-quests to solve and monsters to slay. With each level up you increase your base stats, which consist of health, willpower, strength and dexterity, as well as various skills.

Skills are comprised, for the most part, of a variety of combat manoeuvres, such as kicking dust in your opponent's eyes, disarming them and breaking their shield. There are also four magic schools of earth, fire, wind and water, with the fifth school, necromancy, having to be learnt somewhere in the game.

As we played, we couldn't help but draw comparisons to Bethesda's *Oblivion*. Big rolling landscapes dotted with trees, packs of wolves and bandits as you travel the roads and curious special effects that make you wonder 'if I walk into that, will I die?' (*bit like STALKER in that respect too!* – Ed) The game landscape looks pretty and well-designed, however, and the world is huge.

Two Worlds is pitched as a game where your actions have an impact on the world. Yet, after about a week's worth of playing, we have yet

Two Worlds

Chris Booker knows which world he'd prefer to be in.

Roleplaying games come in a few flavours. There's the hack'n'slash kind, where conversation is kept to a minimum and you focus on beating up creatures, levelling your character and getting phat loot. Then you have the RPGs that are a little more social. Fighting is not the only way to solve problems; you can convince the bandits to abandon their life of crime and

become honest potato farmers, or something to that effect. While being marketed as the latter type, Reality Pump's *Two Worlds* is definitely more suited to the former crowd.

The story starts with the main character being informed that his twin sister has been kidnapped. The perpetrators are under the impression that the twins are linked to an ancient evil, and want



Horses can be mounted to increase the amount of damage you can dish out. Hairy highlanders can not.





to see our actions have an effect on the bigger picture beyond the quest giver saying 'Thanks for finding my dog'. The closest we found was that doing quests for one faction increased our standing with them. If your reputation is too low, you will flat-out be refused entry into certain towns, while higher reputations will grant discounts at allied stores and a greater selection of items.

Being refused entry to a town wasn't too big a drama, as beating the gate guard to a bloody pulp and opening the town gate yourself didn't seem to provoke any sort of negative reaction from anyone at all. It's almost as if nobody liked the gate keeper, and everyone was secretly delighted to not have to deal with him anymore.

In fact, at one point in the game you need to get a relic for part of the main quest, but it is in the hands of one of the faction leaders. He tells you to go talk to his people and help them (Read: Build your reputation, in game mechanic-speak) and he will give you the item. Seeing

as how it was nigh impossible to find out which people were actually members of his faction, let alone had a quest to offer, we decided to try him out and picked a fight. Not only by beating him did we gain access to the item we needed, no-one seemed to mind that we had killed their leader, and life resumed as normal.

As for quests, it was often very difficult to find out where you're supposed to be. For one quest, it is hinted that 'The Brotherhood' may know where to find an item we needed. After messing about we eventually figured out that the 'The Brotherhood' was the equivalent to the 'Fighters Guild', and naturally none of their members had the faintest idea what we were talking about in regards to the quest item.

We'd recommend this title for someone who was looking for Oblivion with a greater emphasis on combat and loot, minus the whole 'role-playing' thing. Enjoy exploring the world, bashing orcs, robbing their corpses and gaining levels. Just steer clear of the quests.



Developer Reality Pump
Publisher Red Ant
Website www.2-worlds.com

Recommended 2GHz CPU; 512MB RAM; Vista or XP; DirectX 9.0c.

VERDICT

Great landscapes; combat is interactive and fun.



Frustrating quests; reputation requirements; dumb NPC logic; role-playing elements kept to a minimum.



SCORE
6.0
OUT OF 10



Two Worlds features armoured, horse-drawn tanks. Just watch your shins getting in and out.

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CULTURESHOCK

Everything you need to know about geek film, music and literature.



Day Watch

CINEMA

Distributor: 20th Century Fox | Web: www.foxsearchlight.com/daywatch
Director: Timur Bekmambetov | Starring: Konstantin Khabensky, Mariya Poroshina, Zhanna Friske

For fifteen minutes, director Timur Bekmambetov maintains the illusion that he's learnt his lesson from the clunky, confusing and unashamedly derivative *Night Watch*. Sadly, once the 16th minute ticks over, *Day Watch*, makes the same mistakes as the first film, while somehow committing a few new ones.

Based on the second novel of a trilogy written by Russian author Sergei Lukyanenko, *Day Watch* picks up the action shortly after the activities of the first film. A much wiser and experienced Anton Gorodetsky (Khabensky) returns, along with Svetlana Nazarova (Poroshina), a timid woman of potentially great power who he now trains for the Night Watch.

For those unfamiliar with the series, the world's population is split in three – Light Others, Dark Others and everyone else. Naturally, the Dark and Light Others aren't fond of each other, and to prevent the destruction of the world, struck a truce some 1000 years ago. To keep the deal in check, the Light Others patrol during the night for Dark Other activities that violate the truce, while the Dark Others do the same for the Light Others in the day.



In *Night Watch*, it was revealed that Svetlana is the Light's Great Other, while Anton's illegitimate child, Yegor, is the Dark's Great Other. *Day Watch* serves as the build-up for a climatic battle between the two forces and a confrontation of the Great Others. Mixed in is the mystical Chalk of Fate, which is, quite literally, a piece of chalk that can rewrite the fate of the user.

What the film does right are the action scenes, intense set pieces that, while sometimes out of place, are enjoyable to watch for their shock value. There's a bit with a car driving on a building, sideways, and an amazing five-minute chunk at the end involving *lots* of silver Christmas decorations.

The overall feel of the film is gritty and the cinematography sharp; both fit perfectly with a downtrodden Russia and the tense state of affairs that binds the Light and Dark.

The power of the film is snuffed however by Bekmambetov's dislike of magical elements, one of the main themes of Lukyanenko's novels. It's a failing that was readily apparent in *Night Watch*, and even more so in the sequel. When the Others do use their powers, it's a case of 'Oh, you can do that? Why didn't you just do that when...'. Anyone expecting a Russian X-Men will be extremely disappointed.

Perhaps the lack of magic would have been balanced by a strong plot with engaging character development, but again, the film can't deliver. Except for Anton, none of the players are explored really, nor are their relationships and when they are, it's so confusing as to be pointless.

The Chalk of Fate is also a bizarre facet in the story. Not only does it serve as the deus ex machina for the film's disappointing conclusion, but for such a wickedly powerful artefact it proves incredibly easy to acquire and use.

Despite its faults, *Day Watch* is a better film than its predecessor. The plot is just as convoluted, or appears that way under Bekmambetov's direction, but it's much less derivative and the product placement not so obvious. If you hold tight to your brain as the story comes together, you might just come out of the cinema ambivalent.

LB

score **7.0**
OUT OF 10



Sex.com

BOOK Publisher Murdoch Books
Author Kieran McCarthy

It's the late nineties. A man has just bought his first computer. He's heard from a workmate that there's porn on this new fangled Internet thingy. One evening when he's feeling randy, he fires up Netscape Navigator and enters 'www.sex.com'. There's no mistaking why the domain sex.com came to be worth millions of dollars during the dot-com boom.

For so many non-computer savvy blokes, it was – and possibly still is – the logical place to go for, er, inspiration. Similarly, there's no mistaking why Stephen Cohen – a suave, seductive conman with a record longer than a male porn star's appendage – put so much effort into stealing it from its rightful owner, entrepreneur Gary Kreman. The story of the sex.com domain and the bitter dispute between these two men would be compulsively readable... were it told over the course of say, twenty or thirty pages. *Sex.com*, weighing in at 275 pages is a little ponderous.

Don't get us wrong, it isn't a bad book. The details of Cohen's previous criminal ventures and personal life are equal parts disturbing and intriguing. It's a shame we find out so little about Kreman, aside from the fact he suffered from an addiction to crystal meth and was always, despite his naivety, a bit of a visionary. Search your library or wait for the mass-market paperback. It's interesting, but not worth the \$29.95 asking price. **CT**

score **6.0** OUT OF 10



Harry Potter The Deathly Hallows

BOOK Publisher Bloomsbury
Author JK Rowling

So here we are. Finally. The seventh and supposedly last instalment of JK Rowling's famous series. If you're yet to read it, you likely just want to know the answer to one question: is it any good? Well, yes, it is. It's very good. Hell, we'd go so far as to say that it's our favourite in the series, but that doesn't mean it's flawless.

Firstly, *Deathly Hallows* could've done with a bit more editing. There are numerous spelling mistakes. A few of the passages are almost unintelligible, while others are unnecessarily repeated – verbatim, in some cases – several times throughout the book. And, towards the middle in particular, there were some very serious pacing issues. But as we said, for the most part it's great. It's engaging, emotional, entertaining and everything we could've wanted and expected it to be – except when it comes to the ending.

Curiously, not long after closing the final page we had a vision in which, come the time of the seventh movie adaptation, Rowling appears saying she just hasn't been able to let go of Mr Potter and has decided to take him on further adventures. Perhaps we're wrong, perhaps she's really going to let him rest... but we doubt it. Whether we journey with the boy wizard again or not, rest assured this book is wonderful. Except when it's not. **CT**

score **7.0** OUT OF 10

ANIME OF THE MONTH

Your regular dose of anime goodness courtesy of our resident expert Armina Soemirno.



Afro Samurai

Studio GONZO Distributor Madman Web madman.com.au Price \$29.95

Everyone wants to be #1, but no one more so than the #2. And the Afro Samurai is just that, holding the #2 headband but doing everything possible to get the top one once held by his dad. But in terms of animation, storyline, design, fight sequences and music, the anime itself deserves to be the #1 its main character so covets.

Afro Samurai, created by those geniuses at studio GONZO, is both futuristic, featuring a plethora of cyborgs, and yet historic, with art reminiscent of feudal Japan. Although the plot seems like a rehashed revenge story it is done in such a unique way it holds you spellbound with its sleek urban feel. The main voice actor contributes to this – Samuel L. Jackson, who we absolutely love. He adds to the beautifully stylised characters, the well-choreographed fights, and the best music we've ever heard, composed by hip-hop artist RZA who captures the grittiness of the story in the theme song.

Overall, *Afro Samurai* is the epitome of cool. Seriously, watch it now.

score **9.0** OUT OF 10

GEEKETTE

A girl's eye view of the gaming world.



Is dog spaying the next fun activity to find its way into Ubisoft's Nintendo DS portfolio? We hope so.

The secret kitchen level

Kate Inabinet wonders if gaming has taken a monumental step backwards.

At this year's E3, Ubisoft unveiled its IMAGINE series of games for the DS. Not content to sit back all wide-eyed and envious while others grow fat off the growing casual gaming market, Ubisoft has been busily creating new titles that are to be marketed specifically at girls aged six to 14.

These games supposedly appeal to the interests of young females and include IMAGINE FASHION DESIGNER, IMAGINE ANIMAL DOCTOR, IMAGINE FIGURE SKATER, IMAGINE BABYZ and IMAGINE MASTER CHEF and are an attempt to fill a void in options for potential new girl gamers.

Not only do I find it sad that any stigma attached to boys wanting to be a figure skater or a fashion designer will be perpetuated by a campaign such as this, but the GIRLS ONLY implication of looking after babies and cooking is enough to send me into a blind rage.

In my mind, instead of being pioneers in the world of casual gaming, Ubisoft has taken the entire movement back ten years via segregation. The whole *boys only* theme in regards to games is what has been turning girls off for years. Girls don't want to be a separate entity in the gaming community – there is already a feeling of division without a marketing campaign behind it – girls want to be included. The reason Wii enjoys such immense popularity is because Nintendo made gaming simple and inclusive, not gender, age or skill-orientated.

Also, Ubisoft is hardly encouraging girls to take on the idea of 'gaming' as a valid pastime, which I would've thought would be the publisher's aim. These titles are little more than electronic games of dress-ups. Once girls grow tired of them, there is little motivation for branching out into the wider world of games to spend more of those precious dollars. Unless of course Ubisoft plans to expand on its range of 'pink' games in which case, following the trend it has already set, should go something along these lines:

IMAGINE LITTLE WOMAN puts young players into the wonderful world of house maintenance and family care. Use the stylus to iron mountains of clothes, or push the vacuum cleaner around. Have fun playing a seemingly endless array of mini-games like Oven Cleaning in under 30 minutes, or Multitasking – how many chores can you complete at the same time?

Accumulate Housekeeping points to buy appliance upgrades, or use the Chat option to hang out with your friends from Mother's Group.

Or perhaps the next-gen IMAGINE series intends to focus on male stereotypical roles instead and will include such titles as:

IMAGINE MUSCLEBOUND allows players to be a professional bodybuilder using the stylus to lift weights in the virtual gym. Players can customise their programs to focus on specific muscle groups and check

their progress in the measurement option. There is also the bonus kitchen challenge where players get to create exciting recipes using only chicken, rice and protein shakes.

In IMAGINE COMMITMENTPHOBE, players live the life of a 30-something ad-exec who needs to prove himself by juggling six girlfriends at once. Boys take on the role of the smooth operator as he remembers to call each girl by the correct name and taking them on increasingly risky public dates while fielding phone calls, answering hairy questions, and negotiating environments to avoid being caught by any of the other girls.

IMAGINE BINGE DRINKER with Wi-Fi allows for multiplayer action as you party with up to eight friends in a series of unlockable pubs. Fun mini-games include singing along to your favourite footy anthem, trying to remain upright and pee without getting any drops on the floor, and Beer Goggles where you rate passing females from one to 10.

If Ubisoft just put its new range of games out without a gender bias, I believe it could have the wide appeal it so craves, potentially enjoying a similar success to Nintendogs. The fact that it has made the subject gender-biased means it continues to halve its revenue by excluding part of the market.

Ubisoft may have thought it was using its imagination in its titles and marketing ideas, but instead shows a distinct lack of it.

Kate thinks games should be about fun things not housekeeping. Tell her how crazy she is.

geekette@atomicmpc.com.au



“ Use the stylus to iron mountains of clothes, or push the vacuum...” ”

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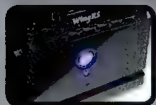
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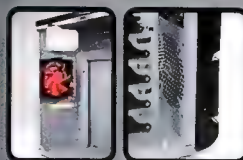
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TECHNIQUE

HANDS-ON TUTORIALS FOR THE TECHNICALLY INCLINED

Finally, we've made it to part 3 of Leigh Dyer's tasty tutorial on making music in Linux. With the wise words from this article under your belt, you'll be composing digital tunes in no time. Or, if you have things to do, a little bit of time.

Jake Carroll this month spent a few sweaty days with his collection of

DVD burners to create the perfect tutorial to disc heaven. If you've ever been confused about burning engines, ASPI or the aerodynamics of your dad's once-glorious afro, then head on over.

Also included in the next few pages are Input Output, where Dan fixes stuff and Fallout, which features a super-special Meet 7.0 pictorial.



TECHNIQUE CONTENTS

Making music in Linux, part 3 86

Leigh Dyer concludes his tiny epic on blasting bass from your open source box. Contradictory words there, yes, but they're incorrectly right.

The perfect burn 90

Getting data on your DVDs has never been so complicated, with optics and media playing a big role these days. Let Jake Carroll take your hand.

Input Output 94

Dan Rutter opens his toolbox and sets to work on solar panels, a defragging problem, and people who graft magnets into their fingertips. There's also something in there about a horse.

Hotbox 96

Sexy cases full of sexy hardware. Also includes bonus prize giving!

Fallout 98

Pictures from Meet 7.0 to assault the senses. And by assault, we mean an aerial bombardment.

Have an idea for an Atomic tutorial?

Then send an email to lbooker@atomiclamp.com.au

When it comes to tutorials, Atomic likes to tackle the hard stuff. If it's not hard enough, we just don't do it. Alright – that's not necessarily true, because every once in a while, we like to cover the easy tutorials too. Not so much easy as basic, you know... building the skills, the foundations you need so you can have a go at those tricky tutorials.

We know that techniques change, as does technology, and guides that might have been useful a few years ago can be close to useless today. So, if you have an idea for a basic tutorial, like soldering, water-cooling or harpooning whales even, let us know.

Now go email!





DIFFICULTY INTERMEDIATE

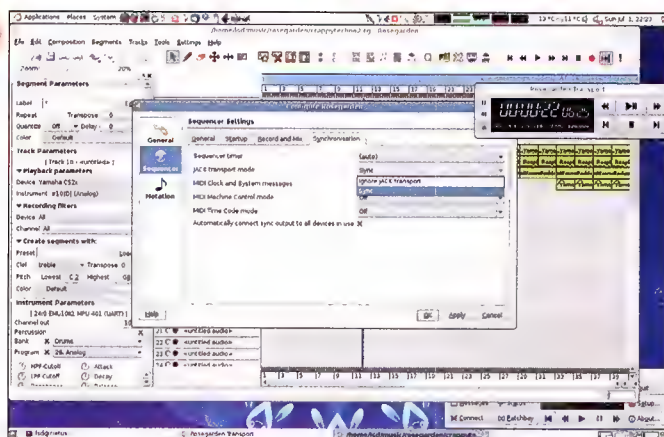
Making music in Linux, part 3

Leigh Dyer puts the finishing touches on his open source tune machine.

Last month, among other things, we looked at a great drum synth and sequencer called Hydrogen. If you've played a bit with it you've probably come to appreciate how easy it is to put together custom drumkits from your own samples, or samples culled from other kits, and how quickly you can put down some patterns and string them together. There's one unanswered question, though: If you have your main instruments in Rosegarden, and your drums in Hydrogen, how can you work with them simultaneously?

JACK provides the solution with the JACK transport. It gives you a centralised set of transport controls that all of your applications can hook in to, which means that you can hit 'play' or 'stop' in one place and have all of your applications respond simultaneously. The only manual aspect is to ensure that you have all of your applications configured to the same tempo.

To enable JACK transport support in Rosegarden, go to 'Settings | Configure Rosegarden' and open the 'Sequencer' section. Switch to the 'Synchronisation' tab, and switch 'JACK transport mode' to 'Sync'. In Hydrogen, it's a lot easier – just toggle on the 'JACK TRANS.' button in the transport panel. Both applications use the same method to change



▲ While Rosegarden hides the option deep in its settings.

the tempo – double-click on the current tempo (Hydrogen calls it the 'BPM', or beats per minute) in the application's transport panel and enter the new value.

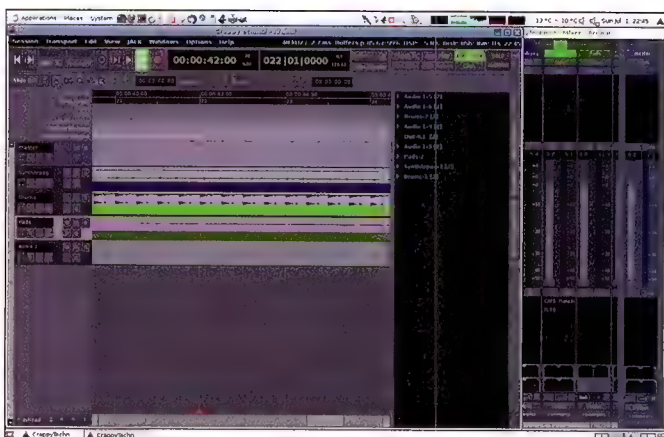
Once everything is set to use the JACK transport, switch back to Rosegarden and hit play – with any luck, Hydrogen will fire up simultaneously. If you want to, you can also control your JACK transport apps from the play/pause/etc. transport controls in the QJackCtl interface.

Recording with Ardour

Depending on what you want to do, you can work entirely inside Rosegarden, perhaps with help from Hydrogen, but eventually the time



▲ Hydrogen gives you a nice big JACK transport button.



▲ Ardour's a beast, but one that's well worth getting friendly with.

will come to mix everything down in to a single stereo audio track, ready to be burned to a CD or converted to MP3 for distribution. You might also want some more heavyweight audio recording features – Rosegarden can record audio, for live instruments and lyrics, but it's not the best tool for the job.

That honour goes to Ardour, a multi-track recording application that's trying to position itself directly against the big digital audio workstation tools like Pro Tools. It's designed with professional work in mind, which means that it can be a bit hairy for new users to come to terms with, but the learning curve is well worth it.

Ardour can be complex to build, so you definitely want to stick with a distribution package if possible. The brand new 2.0 version is only a few months old, so it missed the Ubuntu Feisty release, but it is in the repository for Ubuntu Studio, a project that's aiming to improve Ubuntu's support for audio and video work. If you're running Feisty, follow the instructions on ubuntustudio.org/downloads to add the Ubuntu Studio repository, and then install Ardour 2:

```
sudo apt-get install ardour-1686
```

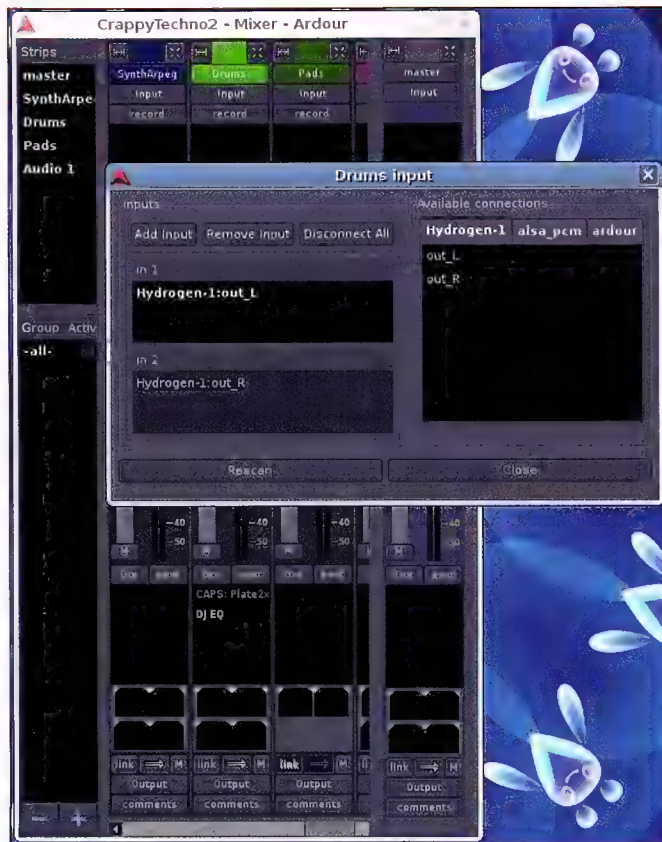
When you first start Ardour, it'll ask you to create a new session for your project. This is a folder that holds all of the individual audio files and other bits and pieces for the project. Enter a name and hit the 'New' button to bring up the main interface. It's a bit frightening at first, but just take a deep breath and forge onward!

At the heart of Ardour is the track list, which runs down the middle of the main window. Each track consists of one or more 'regions', which are chunks of audio – the basic building block of compositions in Ardour. In a simple multi-track recording, each track will probably have just one region of audio, but if you want to work with the audio inside Ardour you can easily chop large regions in to smaller regions, trim regions down, or copy/move them about along or between tracks.

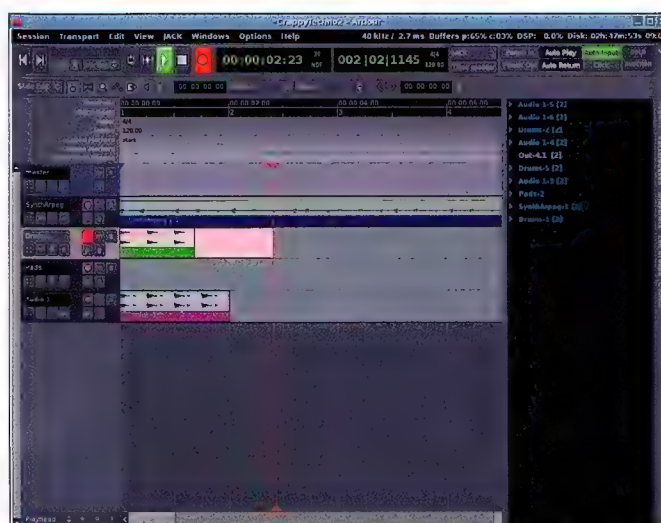
At first, the only thing in the track list is the 'master' track, which is actually a 'bus' – a virtual track that combines the output from one or more real tracks. This makes certain tasks, like applying effects across multiple tracks, much simpler. For now, though, we'll stick with this single bus setup.

Follow these steps to create some tracks and record in data from Rosegarden and Hydrogen:

- 1 Right click on the grey area on the left below the 'Master' label to bring up the 'Add track/bus' dialog. Make sure 'Track' is selected, as well as a 'Stereo' channel configuration, and then add two tracks – one for Rosegarden, and one for Hydrogen.
- 2 The new tracks should appear in the track list, labelled 'Audio 1' and 'Audio 2' respectively. It's a good idea to click on these labels and edit them to match what you're recording.
- 3 Under the 'Windows' menu, select 'Show Mixer'. The mixer lets you add effects and adjust track volumes and panning, but for now we just need to change the input sources for the new tracks.
- 4 In the mixer, find the label for the track you've created for Hydrogen's drums, click the matching 'Input' button and select 'Edit'. In the input edit window, click 'Disconnect All', and then find your Hydrogen outputs on the right-hand side. Click on the 'out_L' and 'out_R' outputs in turn: The 'in 1' and 'in 2' values on the left should update to match.
- 5 Hit 'Close', and then repeat step 4 for the Rosegarden track. If you're using softsynths inside Rosegarden, then you should use the Rosegarden master outputs. Otherwise, if you're using external softsynths, select the outputs for one of them here, or if you're using an external hardware synth, select the 'alsa_pcm' capture ports.



▲ Editing track inputs in the mixer.



▲ Recording from multiple JACK outputs simultaneously.

- 6 Back in the Ardour main window, click on the red 'record' buttons next to your new tracks.
- 7 At the top of the main window, on the right, there's a dropdown box that contains time synchronisation options – by default, it's set to 'Internal'. Click on it, and change this to 'JACK', to sync to the JACK transport.
- 8 Hit the master 'Record' button in the transport controls at the top left of the main window, and then hit the 'Play' button.

If everything is working properly, Rosegarden and Hydrogen will both start playing, and their outputs will be recorded into Ardour as new audio regions inside the tracks you've created.



Editing and effects

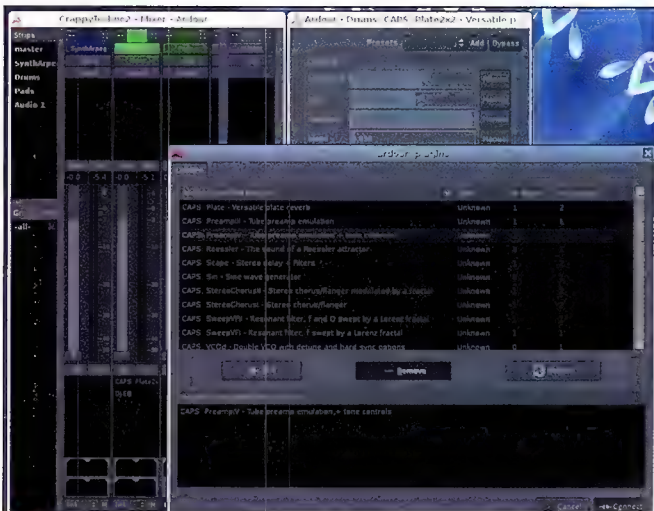
Once you have some audio regions inside Ardour, shuffling them about is a very quick and easy task. Ardour works non-destructively, which means that it never actually edits the audio – trimming the start of a region, for instance, just changes how the region is played, rather than actually removing the trimmed data.

This system has a lot of advantages, particularly when it comes to copying regions. Because you can't change the underlying data, there's never any need to duplicate the data in a region – you can just create new regions that link to the same data as the original. Certain operations, such as stretching or shrinking a region, do require changes to the underlying audio, but the original data is still kept around, so you never have to worry about edits on one region affecting other regions.

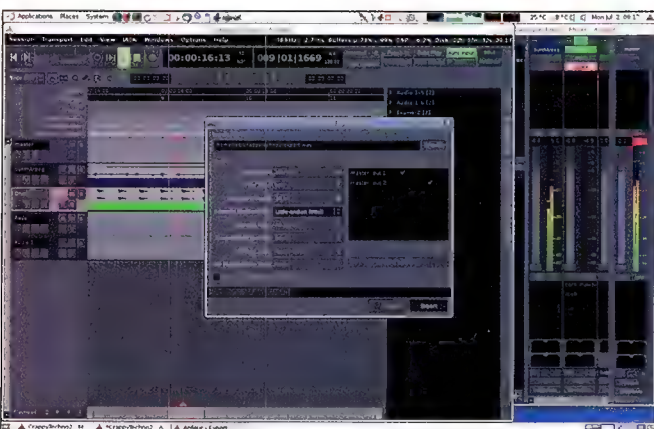
To move a region, either within a track or between tracks, simply click and drag. To copy a region, click and drag with the Ctrl key held down. To trim a region, move the cursor to the edge of the region, in the label area under the sound data – the cursor should change to a 'resize' cursor. Click and drag to perform the edit.

For big regions that need to be split in to smaller chunks, go to the toolbar at the top of the main window, just below the transport controls, and switch to the 'Select/Move Ranges' tool. You can then select ranges inside a region, and use the cut/copy/paste tools to turn those ranges into new regions.

Ardour applies effects at the track (or bus) level in real-time, just like a real mixing desk with hardware effects units, so you'll need to switch back to the mixer to apply them. Each track in the mixer has two areas



▲ Ardour relies on LADSPA for all audio processing.



▲ Export your many tracks to a single stereo WAV file for distribution.

for effects – one above the volume, or 'Fader', controls, and one below, which produce subtly different results.

To add an effect, right click in an effects area and select 'New Plugin', and then choose the LADSPA plug-in you want to add from the list. Ardour relies a lot on LADSPA effects: It doesn't have any sort of built-in reverb or even an EQ, but there's no real need for half-arsed built-in processors when you can load in LADSPA plug-ins to do the job.

Once your work is complete, you can export it to a plain audio file by opening the 'Session' menu and selecting 'Export/Export session to audiofile'. You can export in various formats, but the safest option for further distribution (for encoding to MP3 or burning to CD) is 16-bit WAV at 44.1kHz.

Sparkle


If you want to add some sparkle to your recordings, JAMin (jamin.sf.net) is a fantastic tool. It's a 1023-band graphic equaliser that's perfect for last-minute tweaking.

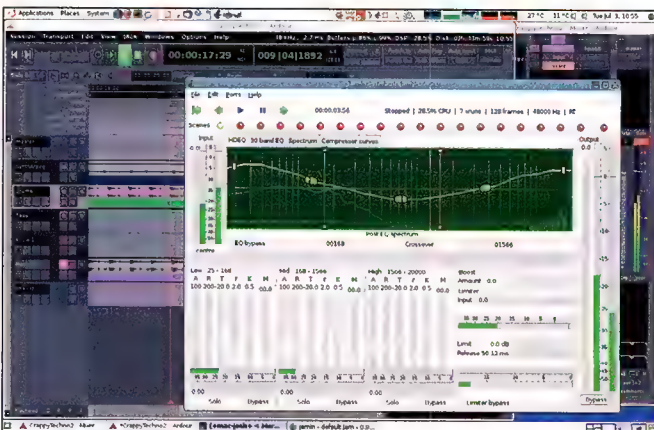
We'll integrate it in to Ardour using a bus:

- 1 Run JAMin. Its interface looks very impressive, but we'll get to it shortly.
- 2 Create a new bus in Ardour, and change its label to 'FinalEQ'.
- 3 In the mixer, on each track click the 'Output' button, then 'Disconnect All', and then add the ardour/FinalEQ inputs by clicking on them.
- 4 Click the 'Output' button on the FinalEQ bus, hit 'Disconnect All', and then add the 'jamin' inputs.
- 5 Click the 'Input' button on the master bus, hit 'Disconnect All', and then add the 'jamin' outputs.

In this setup, your audio tracks run through the FinalEQ bus in to JAMin, and then back into the master bus before hitting your sound card. The large green area in JAMin is the equaliser interface – click in here to start drawing a curve, and then click to end. To give your music more impact, try a curve that's high at the left and right sides, and lower in the middle.

To record the output, create a new track called 'Mastered'. In the mixer, set its inputs to the JAMin outputs, and clear its outputs. Hit the record button on this track, and the master record button, and play your recording – the equalised audio should be recorded in. To export this, open the 'Export session to audiofile' window again, but de-select the master outputs on the right. Click 'Specific tracks', and select the 'Mastered' track outputs instead, before clicking 'Export'.

There's more to the world of music on Linux than we could hope to cover here, but with the key tools we've covered, you'll be off to a good start. Get out there and see what you can come up with! 



▲ Ardour to JAMin and back again.



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First things first, knowing the originating manufacturer of the OPU (Optical Pickup Unit) and micro controller in your burner is the key to all of this. Based on the OPU, decisions can be made as to the reliability and characteristics of write performance.

Learning to drive

Lite-On has built up a strong reputation in the enthusiast computing community because of its mod-friendly firmware. Lite-On uses MediaTek chipsets to drive its controllers and OPUs, which uses relatively primitive firmware and controller designs, even in its most current 20A1S x20 DVD writers. Lite-On's feature set implements all the usual calibration technologies. The firmware is always in plain text, so modification with simple patching tools isn't a difficult process.

That said, for all Lite-On's tweakability, the build quality of its OPU could be improved. This puts Lite-On outside of the industrial burning environment, but well inside the enthusiasts segment.

Pioneer creates writers for industrial markets, and as a result of Pioneer's serious nature, several aspects of

the burner design are conservative. Pioneer firmware, for example, is encrypted and extremely hard to ROM dump, so leave modding to the friendly neighbourhood firmware hacker.

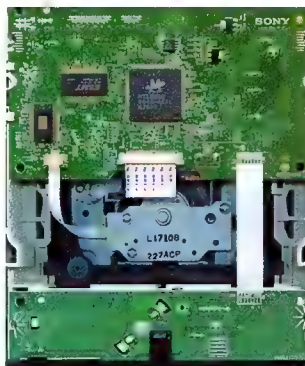
The current chipset in the R12 series is the NEC MC-10041. Don't expect speed hacks or x18-to-magic-x20 forced firmware upgrades. Each firmware goes through a dedicated verification suite for each MID (Manufacturer ID) embedded in the firmware. For this reason, when you pop a disc on to burn in your DVR-112/212 or BDR-202 unit, you can be sure that it will be writing with optimal power calibration. As a general rule, expect a x2 to x4 speed uplift on supported MIDs (8x to 12x, 16x to 18x), Blu-ray media inclusive.

Through brute-force and strong market proliferation, LG has taken a considerable part of the optical storage market. LG's current GSA-H62LI and Blu-ray hardware are acceptable to the non-enthusiast market.

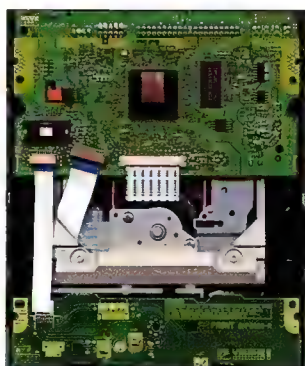
At the moment, LG promotes its products as the fastest writers on the market. Generally speaking, while writing to DVD+R and DVD-R media at rated speeds, this is correct. The caveat is that the write quality suffers. LG use a mixture of MTK and Panasonic MN103SC7GRT1 controllers which will send alarm bells ringing in many minds, as it conjures up thoughts of Matsushita hardware – widely accepted as the worst burning hardware in existence.

ASUS is a point of confusion. Last year, it made Pioneer DVR-based drives, so there was little point in buying an ASUS drive as you were essentially paying for a nicer looking fascia.

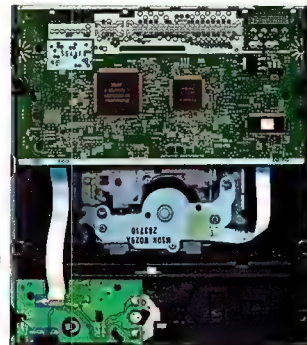
Things have changed, however, and ASUS has stepped out solo with the DRW-1814BLT. The unit is comprised of a MediaTek MT-1899LE controller and a custom OPU from ASUS itself. ASUS hardware has similar characteristics to many of the current Lite-On x20 drives. The unit keeps a fairly constant and reliable write quality path. These units use a PATA-to-SATA internal bridge, and so are not 'true' SATA devices.



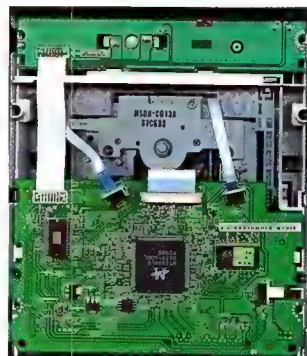
▲ Lite-On's LH-20A1S MTK based SATA writer.



▲ Pioneer's DVR-112/212 SATA writer.

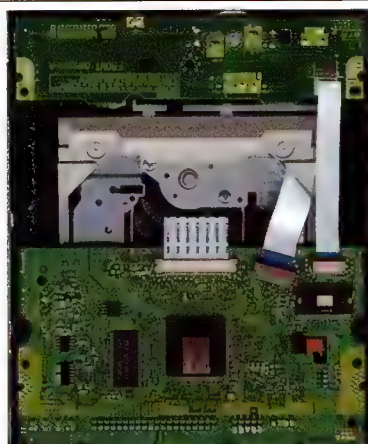


▲ LG's GSA-H62LI SATA writer.



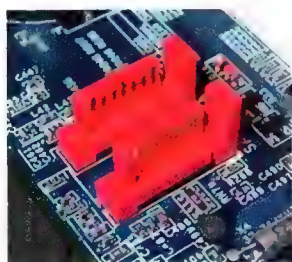
▲ ASUS's DRW-1814BLT SATA writer.

7. CPU and PUH controller send feedback/WOPC data to host/MMC-SCSI origination point, to correct data via burning engine.



4. MMC transport accepts connection, attempts to address internal writer target [media/MID code].
5. MMC transport sends back 'OK' for data flow to begin
6. Writer initiates TOC write/lead in, then data track.

1. SCSI MMC commands sent from OS layer [ASP/SPTI].
2. SATA port addresses termination point, determines if logical MMC target is valid.
3. If target is valid, initiate error control signal, data control signal, MMC write commands.

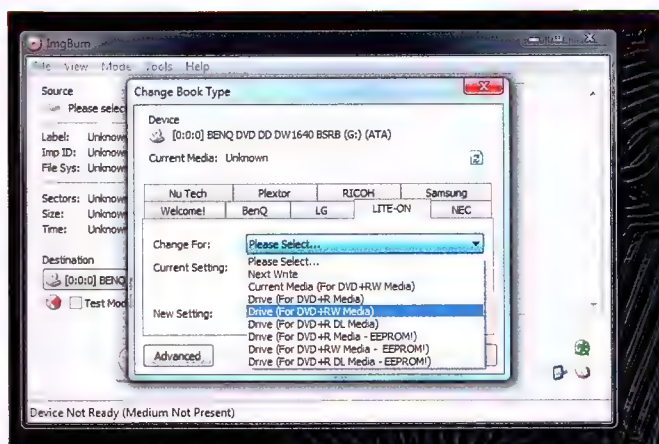


▲ Figure 5 – The MMC chain of command.

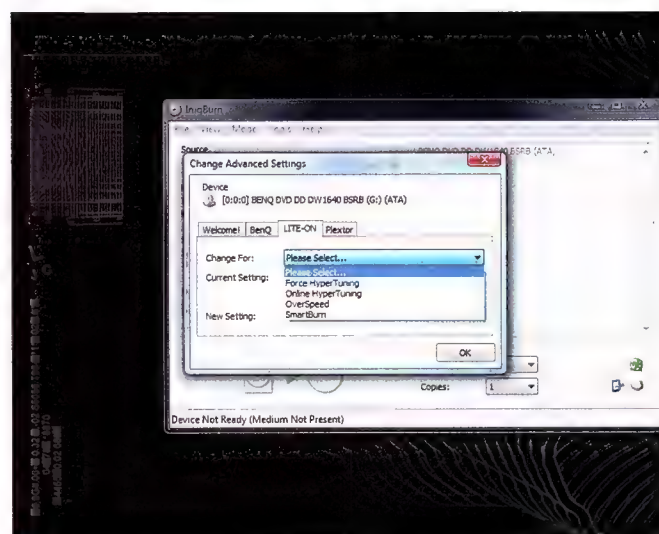
Software

The differences in burning tools often aren't noticeable from a user interface perspective, but matter from a burn quality standpoint. Here's a list of some notorious burning engines:

- Ahead's NERO BE
- The Prassi Engine
- Sonic/Roxio's Dragon Engine
- Plextor's Px Engine
- ImgBurn's LUK Engine
- Disco



▲ Figure 6 – ImgBurn engine extended attributes, booktype setting.



▲ Figure 7 – ImgBurn online WOPC modifiers

What makes them different? To understand this, we need to understand how a Blu-ray/DVD/CD burner interfaces with the operating system and, above this, the software used to burn with.

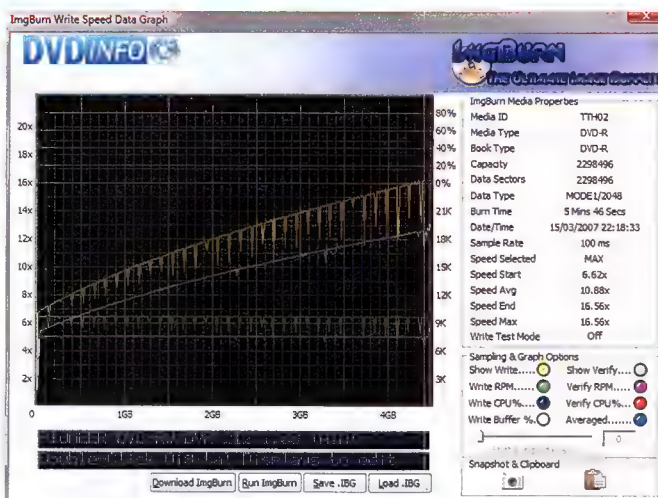
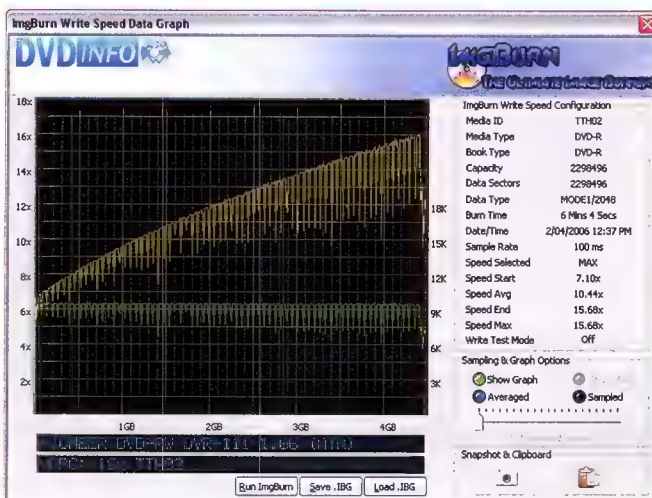
Figure 5 shows that the operating system is the first object to initiate the burning process, via (under Windows XP/Vista) the ASPI (Advanced SCSI Programming Interface) or SPTI (SCSI Pass Through Interface) layer. At this point, the intelligence of the burning engine becomes important. A good burning engine will ask for information from the SATA/PATA controllers concerning termination and bus conditions. A poor burning engine will attempt to send data straight to the opposite bus on the burner, regardless of whether or not the environment is sane.

Once the writer initiates the lead-in record, the drive is already sending information back to the host controller and the OS. If the writing engine is intelligent enough, it will have initially offered options to take advantage of some of these 'extra' information. ImgBurn's extended tools menu shows some of these bi-directional firmware functions in Figure 6 and 7.

Other burning engines such as Nero and Sonic's Dragon engine are capable of booktype setting modification, but only ImgBurn allows you to manipulate the burner's OPU control codes and WOPC strategies with this level of verbosity. Use this weapon to your advantage.

Setting these advanced functions in your writer can have a number of outcomes. Forcing hypertuning can lead to a slower burn, but a more consistent WOPC curve. Overspeeding can result in a much faster burn to non-certified media, but will regularly result in CRC errors. Generally speaking, for burns of a critical nature, these tools should be left alone. An example of the difference between WOPC types can be





▲ Figure 8 & 9 – Write curve differences from altered WOPC types/parameters

found in Figure 8 and 9, illustrating the difference in write/OPU sample depth while the write curve is taking place. Bottom line? Don't be slapdash about your burning engine.

Firmware

You want your firmware updated and you want it feature-packed. DVD writer firmware resides on one region of the drive's EEPROM, and within this, taking up several regions of its own. In EEPROM, these initial device ID segments may look something like this:

```
^}Mn...K...S...MH.}.....&.....16.....
.,....7- &+04....F.{QUGOPBDS CORPROATION
...k.2.....7H.20060927.....
.....s.....#&..O.....
i.....#P.. .0g.s...../'&.e...-
..X.....LHF..&-3.....
.....F..b.&V:.P....v.....
```

This is a dump from the header offsets 0x00000000 to 0x000000E0. Next, we look into the actual control records of the drive near 0x00C20000:

```
-----// LiteOn IT DVDWR Project
Serial flash profile v1.1 By James Huang
.Flash Profile> SST25LF080.Flash Profile>
SST25VF080.Flash Profile> MX25L8005.Flash
Type Error..
```

This is the flash part input/output mechanism header for the LiteOn 20A1P-series hardware. Notice it's all in plain text.

Finally, in our abridged firmware tour, we find RPC and MID data at 0x0019D018:

```
.....SFH.....)>.....MCC 03RG20
...TYG03.....RITEKF1.....MXL
```

BRAND	MANUFACTURER	FORMAT	RATED SPEED	MID CODE
Thats, Verbatim	Taiyo Yuden	DVD-R	x16	TYG03
Thats, Verbatim	Taiyo Yuden	DVD+R	x16	YUDEN000T3
Mitsubishi, Verbatim	Mitsubishi Chemical JPN	DVD+R	x16	MCC004
Mitsubishi, Verbatim	Mitsubishi Chemical JPN	DVD-R	x16	MCC03RG20
Mitsubishi, Verbatim	Mitsubishi Chemical JPN	BD-R 25GB SL	x2	VERBATIMa
Mitsubishi, Verbatim	Mitsubishi Chemical JPN	BD-RE 25GB SL	x2	VERBATIM0
TDK	TDK	DVD+R	x16	TDK003
TDK	TDK	DVD-R	x16	TTH02
TDK	TDK	BD-R 25GB SL	x2	TDKBLDRBA
TDK	TDK	BD-RE 25GB SL	x2	TDKBLDWBA
TDK	TDK	BD-R 50GB DL	x2	TDKBLDRFA
Mitsubishi, Verbatim	Mitsubishi Chemical JPN	DVD+R DL	x2.4	MKM001
Mitsubishi, Verbatim	Mitsubishi Chemical JPN	DVD+R DL	x8	MKM003
Mitsubishi, Verbatim	Mitsubishi Chemical JPN	DVD-R DL	x8	MKM01RD30
Sony	Sony	BD-RE 25GB SL	x2	SONYES1
FujiFilm	RITEK Inc TW	DVD+R	x16	RITEKF1
Memorex	CMC Magnetics TW	DVD-R	x16	CMCMAGAM3

“An all too common mistake in DVD/BD writing is the assumption that slower burns equate to quality. Nothing could be further from the truth...”

```
RG04.....CMC MAG. AM3...SONY16D1.....
DAXON016S.....TTH02.....n.nn.....
.....0.....
.<.....<.....6.h.....
h.....#.#.#.#.#.#.#NPdh~NPdh.NPdh.NPdh.
NPdh.NPdh.NPdh.NPdh.bd.....bd.....
bd.....bd.....cd.....
bd.....ad.....bd.....
.....SONY16D1.....TYG03.....MCC
03RG20 ...TTH02.....MXL RG04.....MBI
03RG40.....CMC MAG. AM3...RITEKF1.....
ProdiscF02....OPTODISC016...BeAll
G16001...CMC MAG. AM1...RITEKM16.....MBI
01RG40.....ProdiscS05 ...NAN YA F02.....
FUJIFILM04.....MUST 007.....DAXON016S
```

These MIDs should look familiar, as this is where we find our source of write strategies and write performance. Keeping your drive updated on a regular basis, with current firmware, will ensure this specific region of the drive's internal software is updated with new media codes and, as a result, the ability to match optimal power/burn length to each pit, with different dye types for different manufacturers.

Here are some simple rules to burn by:

Burn at whatever high speed your writer allows

An all too common mistake in DVD/BD writing is the assumption that slower burns equate to quality. Nothing could be further from the truth. The AZO Organic dye that is used in your DVD substrate layer is designed to work optimally at the rated speed. If you duct an insufficient amount of power to the dye, the results are not as easily controllable, nor will the write be reliable. If your PlayStation 3/Xbox 360/Wii/DVD player refuses to read your burnt media, slowing the write speed is not the answer. Seek out firmware and a better MID code on your discs.

MIDs of legend

It doesn't matter if your burner comes from 18 months in the future and has a GPS attached for user-tracking. If you feed it bad media, you will get bad results (CRC errors). Refer to Table 1 for quality MIDs.

Identification of MIDs is tricky at times. Unfortunately, you need to trust the brand and go with some hard-won experience. Unless you are the unfortunate victim of MID code faking, the brands listed above are very reliable.

You can identify your media's MIDs with either ImgBurn (www.imgburn.com) or DVDInfoPro (www.dvdinfo.com).

Knowing a good burn and a bad burn when you see it

Simple rules can help you understand parity and jitter scans to tell if your burn was one of quality, or one of coaster-fame.

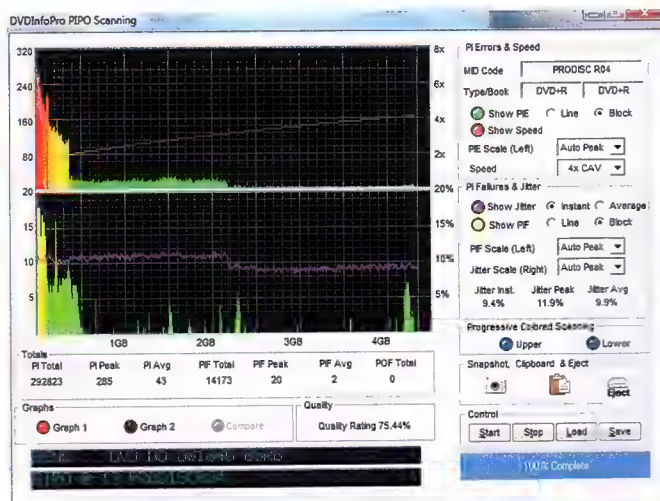
Without trying to explain parity and cyclic redundancy, we can boil 'good' and 'bad' burns down to this. If the PIE response is greater than 280, you have a failure in first level parity recovery, meaning your hardware decoding device will need to drop to second level parity recovery to attempt reading. This leads to noticeable 'stuttering' or 'jumping' in content.

If it fails after this, then the error is non-hardware correctable, resulting in a CRC error – you won't be reading those bits anymore. This is a result of firmware, media and optics quality. Note the codes in Figure 10 and 11. Don't expect that PlayStation game to work if you burn to cheap media on a 3-year old burner with outdated firmware.

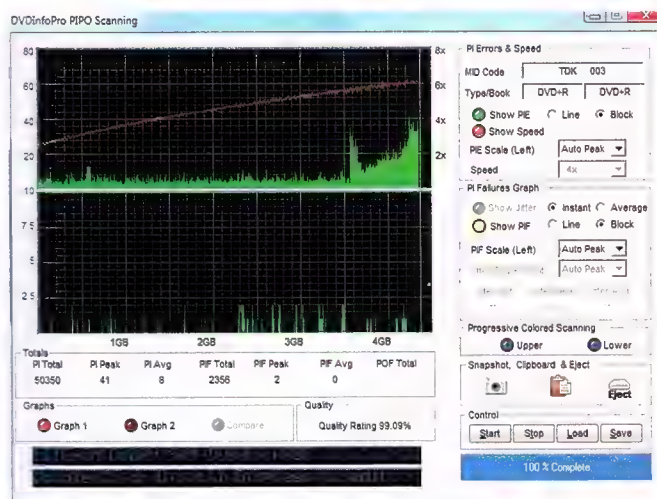
An entire universe is discoverable in the science, art and religion of DVD/BD writing. The more you research, the deeper your understanding of the little beige cup-holder goes. We encourage you to explore your hardware by testing new MIDs, experimenting with different firmware, and, most of all, challenging your burning software to pull off feats of blazing glory.

Help is always at hand – see www.atomicmpc.com.au/forums.asp?s=2&c=29 and www.speedlabs.org for starters.

And if you can't keep it real, at least keep your firmware current. 



▲ A bad burn.



▲ A burn that is not bad, known as a good burn.



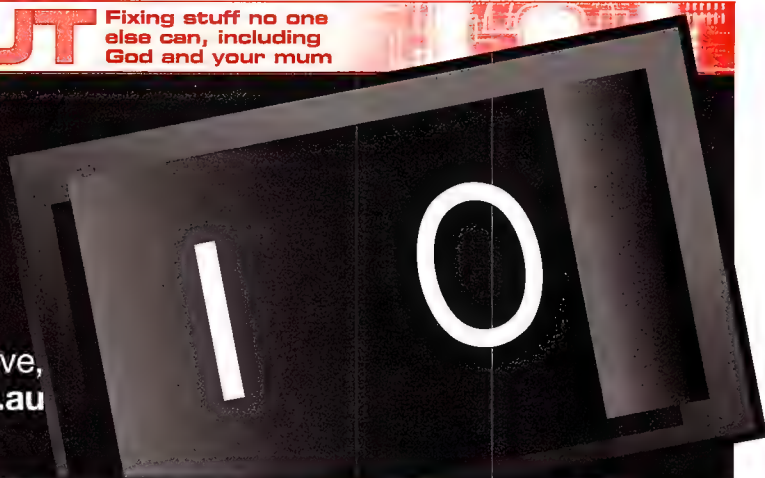
INPUT OUTPUT

Fixing stuff no one else can, including God and your mum

INPUT OUTPUT

Wreck tech

We don't want you to destroy your precious computery stuff, but if you have, **Daniel Rutter** at io@atomicmpc.com.au is the man to talk to.



Big slots, little slots

I Will a PCIe x1 TV tuner card, or any other x1 card, work in an x16 PCIe slot on my ASUS Striker Extreme motherboard? I have two video cards and a Creative X-Fi installed already, and my only free expansion slot is the x16 slot.

I would prefer to use an internal expansion slot rather than buy a USB TV tuner, because the bandwidth of USB is much less than the PCI bus.

Geoffrey Harris

O Yes, it'll work. The little connector on PCIe x1 cards fits into the matching part of the longer x16 connector, and away you go.

Note that some slots that look like x16 actually aren't. It's normal for older dual-x16-slot motherboards to only have eight PCIe 'lanes' connected to the second of those slots; that works fine for SLI/CrossFire, but if you only have one video card and you plug it into the 'x8' slot by mistake, you'll lose a bit of performance. An x1 card should work just fine in the x8 slot, though.

On your board, you have two blue full x16 slots, and one white eight-lane x16 slot between them (along with an x1 and a plain PCI slot).

More perniciously, some motherboards have an 'x16' slot with only one lane connected. They're usually boards with onboard video; the manufacturers don't expect many customers to use the 'x16' slot for a video card, so they cut corners.

Some, but not all, x16 cards will work in one of these cut-down x16 slots. Once again, though, any x1 card should be fine.

Ctrl-Vefrag

I I do a lot of encoding whenever I record some videos and I find that my disk fragmentation level becomes very high within three months.

I am planning to build a HTPC containing a fair amount of storage (500 GB+). I'll be heavily investing into more space for this upcoming project of mine.

Rather than doing more frequent defragmentation, I was wondering if it's faster and more efficient to create smaller partitions, say

100GB each, and schedule a task which will do the following every 3 months for each partition:

1. Copy the contents of a partition to another empty partition
2. Format the current partition
3. Then copy the content back to the original partition once the format has been completed.

If there was a partition that is very fragmented, would copying all the files to another partition automatically resolve fragmentation issues? Would copying the files reallocate all of the data blocks contiguously, or will it duplicate each block like an image?

King Lam

O Copied files are indeed laid down in contiguous slabs if the empty space on the destination drive permits it. They're not laid down in any particular order – modern defrag utilities put oft-used programs on the faster outer tracks of a drive, if possible – but copying data to an empty drive or partition will indeed defragment it in the process. If you're copying between physical drives, this should also be quite a lot faster than defragging one drive.

Normal defragmentation has to flog the drive

I/O OTM wins a Logitech G5!

There's a mouse in the house. Okay, it's not in the house, it's in I/O. And it looks damn good.

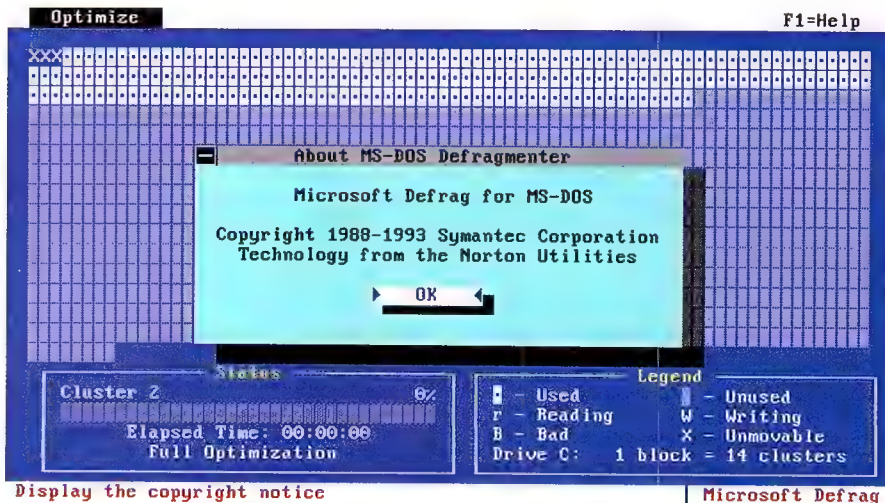


thoroughly, reading and writing zillions of times.

If you're moving data between *partitions* on the one disk, though, the speed advantage will be much less impressive. If you just copy the data from Partition A to a freshly-formatted Partition B on the same drive then the process may be a bit faster than defragging. If you copy back from B to A again, as you're proposing, it's practically certain to be rather *slower* than defragging.

Like magic, I ruin your credit card!

I At a party, someone told me that he heard of a man who had strong magnets implanted in his fingers, the purpose being to detect magnetic fields. Apparently the magnets were coated in silicone, and that this allowed for nerves to grow around the magnets, therefore



Display the copyright notice

Microsoft Defrag

▲ Defrag utilities: Mesmerising nerds since 1975.

becoming part of his nervous system. When waving his hand near a magnetic source, he could 'feel' the magnetic field. My question is: Can he really feel it? Or is it just the feeling of a magnet trying to pull itself out of his skin?

And where can I find a doctor crazy enough to give me some magnets of my own?

Ash Nugent

O Quite a few people have done this over the last several years; check out www.stevhworth.com for one of the pioneers. It's not a difficult procedure, but apparently they haven't quite gotten around the problem of the magnets breaking down and/or being rejected by the body.

As you say, they have so far been using tiny rare earth magnets with a silicone coating, but that's because the silicone is *inert* in the body, not because it encourages anything to grow around it.

People with these implants certainly can feel the magnet move, though; you don't need some special nervous connection to be able to feel very clearly everything that a rice-grain-sized thingy embedded in the end of your finger is doing. The *usefulness* of this new sense is questionable, but it works just fine.

Unfortunately, the silicone coating breaks down over time, and then everything goes to hell and the nasty remains of the magnet have to be dug out again. This is obviously a solvable problem; the magnets just have to be coated with something similarly un-reactive but more durable.

If you want to join the few, the proud, the people who can't have Magnetic Resonance Imaging done on them for a very unusual reason, then there are probably plenty of piercing shops that can help you out. Freaky people have been getting subcutaneous implants of various sorts for ages, and the finger-magnet one is a very minor operation compared with your average Klingon ridge job.

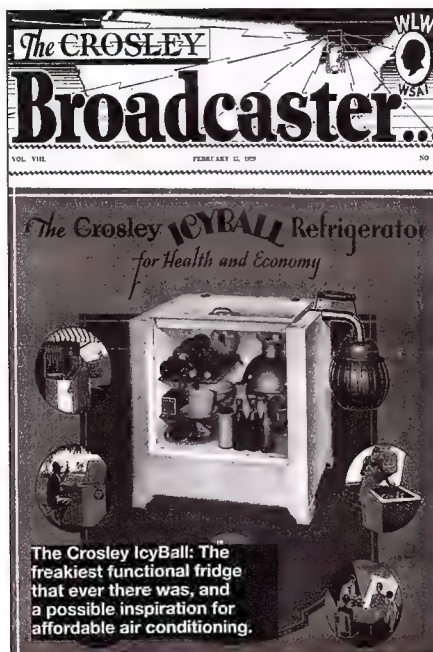
Ice... from fire!

O Recently I've been considering joining in on the fun that causes blackouts in many regions of Oz over summer by purchasing an air conditioner.

Although I'm quite happy to pay the bills just to keep my room and PC chilled, I've been hassled by various family members about the costs. The thought of rigging up a few solar panels to the air conditioner crossed my mind, but common sense tells me I'd only have enough juice to cool my outback dunny for a couple of seconds.

Could I actually run a small air conditioner with solar panels, or should I just strap a few heat sinks to my nether regions to complement my body piercings and stick it out through the heat?

K. R. Ballard



O You'd have to spend a lot of money to get enough solar panels to run an air conditioner.

A small window air conditioner will draw something in the order of 1400 watts when its compressor's running – rather less when the thermostat's clicked off and it's only running its fan.

Solar panels are rated according to their maximum noontime direct-sun output, so you can't run a 1400 watt load from only 14 'hundred-watt' panels. Realistically, even if you're only interested in running the air conditioning during the day and so don't need more than a small battery to smooth out panel output on the way to your inverter, you're going to need more like 3000 'watts' of panels to run a little 1400W unit more or less constantly.

Tracking hardware that turns panels to face the sun can considerably reduce the wattage you have to buy, but it increases the price and hassle of the installation, and doesn't do anything to prevent trees and such from blocking the light.

The retail price for new solar panels is an easy \$7000 per kilowatt (and you need about eight square metres of space per kilowatt, too), so the whole system could easily cost as much as a new car.

One true air-con idea (as opposed to cheap evaporative coolers, which aren't useful in high humidity areas) that *could* work cheaply from solar power is absorption refrigeration.

As the old kerosene-fuelled absorption refrigerators proved, you can run a fridge from any heat source. That includes simple solar-reflector-and-black-tubes arrangements, heating the hot end of a good old-fashioned ammonia-based refrigeration system.

The old Crosley IcyBall is one such idea, and you can find out how it can apply to air conditioning at www.treehugger.com/files/2007/04/still_seeking_t.php.

I/O OF THE MONTH

Grease me up, woman!

O I'd like to submerge a PC in liquid. I've read about it online and also know about Atomic's own mineral oil PC – my question is: where can I get the oil?

Most projects of this nature use vegetable oil, but it doesn't look particularly good and tends to break down. I know there are other products available, but I don't want to resort to selling organs to cover the cost.

Samuel Ferreira

O As you say, vegetable oil is a bad choice. It goes rancid when exposed to the air, and will do so faster when kept warm by a computer.

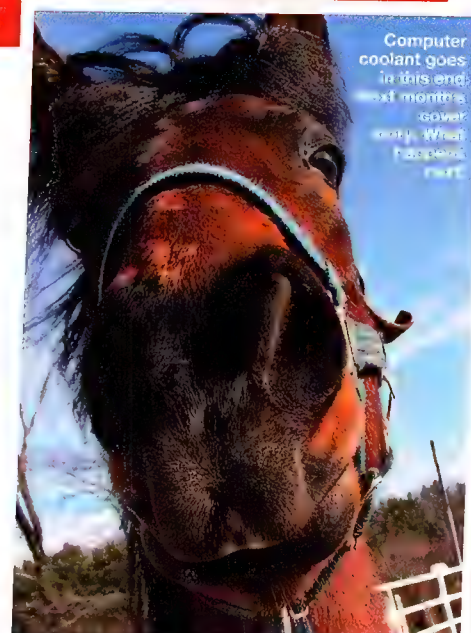
Mineral oil is good, because it's transparent, not very expensive (unlike silicone oil, or really exotic liquids like fluorocarbons), and won't

break down. If you don't care so much about appearances, light motor or lubricating oil should do the trick too; that's pretty easy to find, of course.

You'll need 15 to 20 litres of oil for the average submerged PC. To get that much clear light mineral oil, you can either buy 150 to 200 of those little bottles of Singer sewing machine oil from the supermarket, or you can phone... a large animal vet.

Clear light mineral oil, you see, is used as a laxative.

A few spoonfuls of it will probably have a... noticeable... effect on a human, but you need quite a bit more if you want to get a horse moving. So vets who treat horses will probably be able to hook you up with a supplier of gallon-and-bigger jugs of just the oil you want.



Computer coolant goes in this end... next month's cover story. What happens next?

ATOMICHOTBOX

The best reader-submitted custom made boxes every month.

Welcome to Hotbox! Gaze on the best case mods Australia and NZ have to offer! If you think you box is up to scratch, submit it to hotbox@atomicmpc.com.au.



Wun's Water Box

I initially got into water-cooling for a bit of fun, but as I started to build my PC I soon realised my little Lian-Li PC V 1000 was too small to hold all the parts. So, I got a custom-made MM U2 UFO to make my life easier. I really miss my old Lian-Li with its classy looks, but I just couldn't walk past the U2 UFO.

Unfortunately, the U2 UFO didn't come with any CD bay covers so I decided to turn some scraps of acrylic into a triple bay-sized reservoir to fill in the empty space. While building the reservoir I decided to seal in a thermometer so I could accurately monitor the water temperature.

I made two outlets and two inlets for my dual loop setup by drilling 19mm holes and tapping them for 1/2-inch ID barbs. I put a divider separating the inlet and the outlet so that the reservoir could bleed out air bubbles, and it was also a structural point for me to screw the reservoir into the case. The end result is a massive reservoir that holds about six litres of water.

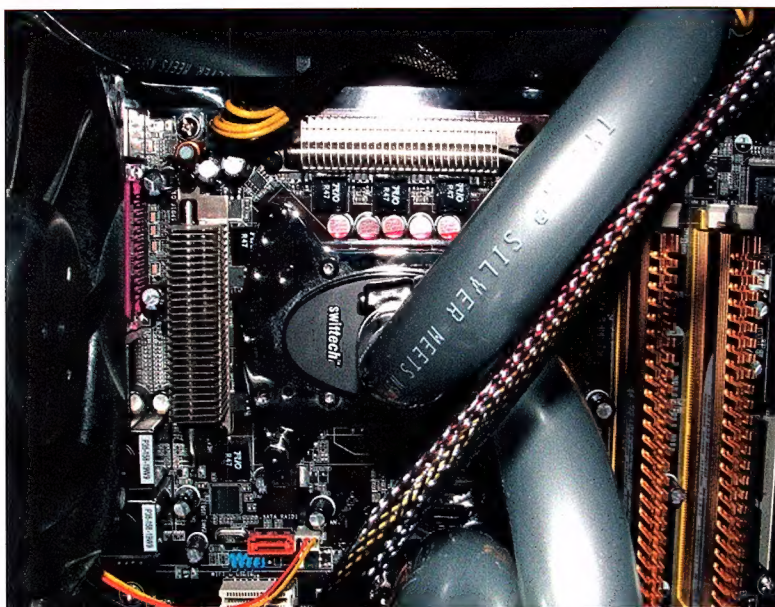
The tubes I use are impregnated with silver. What inspired me to use silver has a lot to do with my occupation as a scientist. I know that silver inhibits the growth of algae and bacterial scum, a problem most water-cooling enthusiasts have. Thus far, the silver works like a treat and I haven't encountered growth or any problems with it.

Another mod is on my motherboard. Originally



Fame, fortune and free stuff can be yours! Send your Hotbox to hotbox@atomicmpc.com.au and make sure you include the following details so you can be eligible:

- ▶ Six to 12 high res, well-lit, pics of the inside and outside of your case
- ▶ A 500-word description of how you made it, the obstacles you overcame, the tools you used, and your inspiration
- ▶ A detailed list of the machine's specs. Include CPU, video card and RAM



it had some heat pipes that got really hot around the northbridge, so I decided to cut off the heat pipe and water-cool it with a Swiftec MCW30. Interestingly, I didn't find any liquids in the heat pipe that was cut, and I presume this is why the NB was cooking in the first place. The southbridge was also a bit hot for my liking, but I couldn't find the space to install a water block on the SB and have SLI at the same time. I managed to get around this by cutting up an old Intel stock cooler and screwing it onto the top of my SB. Currently the NB and SB have 1.6v and 1.5v respectively and I haven't encountered any heat or stability issues.

Being a noob, I didn't overclock a lot despite the fact I knew I had the potential and hardware to do so. What really inspired me to start overclocking was a gift from Corsair – I had received a pair of gold-plated Dominators from a writing competition. I really wanted to push the RAM and I started reading up on how to do so. After enlightening myself with *Atomic*, I managed to overclock my CPU to 4.6GHz and my RAM to 900MHz with 3-3-3-10 T2 times, while my two 7950GTs in SLI run at 620MHz on the core and 880MHz on the memory.



technical details

CPU

Pentium D 960 3.6GHz @ 4.6GHz

MOTHERBOARD

ASUS P5N32 SLI Deluxe

VIDEO

BFG GeForce 7950GT

RAM

Corsair Dominator 8888 C4

EXTRAS

- Western Digital Raptor X in RAID 0
- Creative Sound Blaster X-Fi
- D-Link G+
- Pioneer DVD drive
- 850W Silverstone ST85F PSU
- MM U2 UFO (black with custom windows)

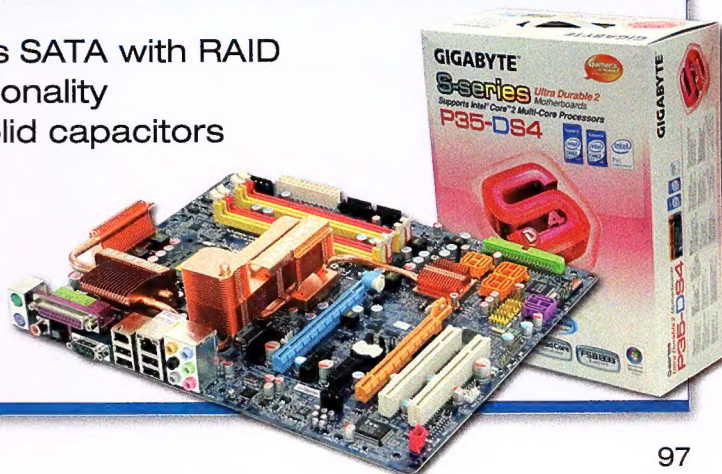
Hotbox of the month wins a **Gigabyte GA-P35-DS4!**

- Intel Core 2 Extreme/ Core 2 Duo/Pentium D
- 7.1-channel Dolby & DTS
- Silent Pipe cooling design
- Dual PCIe for CrossFire

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- 3Gb/s SATA with RAID functionality
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FALLOUT

Funnies and
humour from
the fallout zone

This is just a tribute

Faces old and new at Atomic Meet 7.0!

FALLOUT



NEXT MONTH



THE PERFECT PING

Be the master of every part of your network. *Atomic* delves deep to uncover expert tweaks to optimise the heck out of your NIC, router and TCP/IP settings.

BUDGET AMD GRAPHICS CARDS

A round-up, comprehensive and whole, of a bunch of AMD's next-generation graphics cards, for those who just can't stand NVIDIA.

EVOLUTION OF GAMING AUDIO

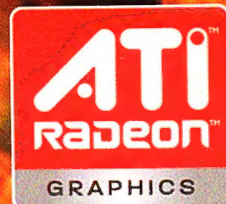
From Miles to EAX, Alexander Gambotto-Burke covers the gamut of audio in games. Time to blow the dust off the Gravis!

VIRTUAL MACHINE GAMING

It's finally here. No need to run Windows anymore just so you can play games. Have freedom and fun, both at once, all thanks to Jake Carroll.

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HD 2600 XT



- ▶ 800 MHz Core
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- ▶ AMD's Universal Video Decoder (UVD) HDMI with HDCP support & 5.1 surround sound

"I personally find the 256MB Radeon 2600 XT GDDR3 the winner..." Guru3D

"...we were pleasantly surprised..." The Register

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